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Changing Challenges of Public Health*

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THE thrill of life lies in its repetitive renewal. The old passes and the new is born. Again and yet again, the social organism—like the individual living being—produces seeds of new life, seeds which, at first tiny and insignificant, have in them the power of growth, the force which drives on to the creation of a new and mighty organism.

We are met together today to celebrate one of the most significant seed times in the history of public health—or rather, not one but a series of birthdays, each marking a notable contribution of the Commonwealth of Massachusetts to the cause of public health.

The first link in the chain of development which brings us here tonight will presumably be commemorated in the form of a centennial celebration in the spring of 1950. It was on April 29, 1850, that Lemuel Shattuck of Boston, Nathaniel P. Banks, Jr., of Waltham, and Jehiel Abbott of Westfield presented to the General Court of Massachusetts a Report of a General Plan for the Promotion of Public and Personal Health, which is, I believe, the most remarkable single document in the history of public health. Its plan for a sanitary survey of the state included practically everything our health departments are now doing, a hundred years later, including registration, sanitation, control of epidemic disease, control of tuberculosis, school health, tenement regulation, factory sanitation, institutional care of mental disease, control of smoke nuisances, education of nurses, supervision of food and drugs. It posed certain problems of public health which have been actually visualized by only a few of our most progressive health officers today. Thus, Shattuck and his associates stressed the importance of town planning and public housing: "We recommend that tenements for the better accommodation of the poor, be erected in cities and villages." They anticipated the very modern specialty of health education: "We recommend that persons be specially educated in sanitary science, as preventive advisers as well as curative advisers." They understood the

* Presented at a meeting in Boston, December 6, 1944, marking the 75th Anniversary of the founding of the Massachusetts State Board of Health, December 6, 1869.

value of what we should today call a local health council: "We recommend that a sanitary association be formed in every city and town in the State, for the purpose of collecting and diffusing information relating to public and personal health."

They clearly saw that the individual as well as the community had health problems which must be considered: "We recommend that individuals make frequent sanitary examinations of themselves, and endeavor to promote personal health, and prevent personal disease."

It was this remarkable report * which led to the establishment of the Massachusetts State Board of Health in 1869. This was not only our first state department of health in point of time. It was for many years first also in quality of achievement. As late as 1915, Chapin's survey of state health organizations gave Massachusetts a score of 745 points on a scale of 1,000, with New York earning 730 points in second place. At no time has Massachusetts failed to rank among the half dozen leading state health organizations of the United States. I should like to think of it as "our" state, rather than "your" state in the long view; for I and my ancestors in the direct male line were citizens of this Commonwealth for nearly three hundred years—until I was tempted as a missionary to the heathen to carry the Massachusetts gospel to your neighbors in New York and Connecticut.

Perhaps the most supremely brilliant period in the always distinguished pages of the annals of this department was the last decade of the 19th century. Following a reorganization in 1886, Dr. Henry P. Walcott became chairman of the board; and a new engineering department was established under the guidance of Hiram F. Mills. This was just at the moment when the new knowledge of bacteriology was transforming the empirical sanitation of an earlier day into an exact science; and, through intimate coöperation with the Massachusetts Institute of Technology, an extraordinary galaxy of genius was at hand to apply this novel science to the problems of public health in Massachusetts. William Ripley Nichols, Thomas M. Drown, and Ellen H. Richards in chemistry, Theobald Smith, William T. Sedgwick, E. O. Jordan, Gary N. Calkins, and George C. Whipple in microbiology, Frederick P. Stearns, George W. Fuller, and Allen Hazen in engineering—never in the history of sanitary science has there been intimate association between so many men who were already world famous or were to become so.

It was my rare good fortune to enter the field at the turn of the century and to serve in a humble capacity on the periphery of this great group. While teaching under Sedgwick at M.I.T., I served for four successive summers (1899–1902) as assistant in the Engineer's Office of the State Department of Health—so that you will perhaps permit me to speak of "our" department, as well as of "our" Commonwealth. I knew all the men listed above with reasonable intimacy (except Nichols, Drown, and Stearns, who had left the organization before my day). I gazed in awe at Dr. Henry P. Walcott, an Olympian figure, embodying all the large and none of the petty qualities presented in Marquand's picture of Old Boston, guiding the destinies of Harvard with his right hand and of Massachusetts with his left (I think the attribution of "right" and "left"

* One of the most prized volumes in my library is a copy of this great report with a long-hand letter of transmittal from Shattuck to the Mayor of Providence which was thrown on a dump many years later, picked up by some discerning citizen and given to Charles V. Chapin and inscribed and presented to me by Dr. Chapin, thus bearing the names of two of the outstanding leaders in American public health.

is properly adjusted to relative values as he saw them).

At least three specific contributions of the Massachusetts State Board of Health at this time proved to be of major national importance and had repercussions far beyond the borders of this continent.

The first of these was the establishment in 1886 of the Lawrence Experiment Station. Here, for the first time, the combined resources of chemistry, bacteriology, and engineering were applied to the problem of sewage treatment, and Part II of a special report issued by the Board in 1890 is the cornerstone of all subsequent development in this art. The principle of biological sewage treatment, the transformation of putrescible organic materials to nitrates by bacterial oxidation, was here elucidated; and the Lawrence studies led at once to the development of intermittent sand filter treatment and —indirectly—through exchange of information between American and English workers—to the evolution of the trickling filter and the activated sludge process.

Meanwhile, Sedgwick, as Consulting Biologist to the Board, was clinching the case for improved sanitation and was developing the technique of the new art of epidemiology—of which he has justly been called the father, so far as this country is concerned. The report of the Massachusetts State Board of Health for 1892 contains three outstanding classics from his pen; the first conclusively analyzed water-borne epidemic of typhoid fever worked out on this side of the Atlantic at Lowell and Lawrence *; the first clearly defined milk epidemic of typhoid, at Springfield; and a small outbreak due to prosodemic spread by contact, food, and flies at Bondsville. This volume ranks with the epoch-making studies of Snow and Budd in England.

Finally, in 1894, came the establishment of the State Antitoxin Laboratory for the application of new knowledge to the practical control of disease by artificial immunization, ranking with the work of Biggs and Park in New York as a pioneer effort in a third major field of public health endeavor.

The work of the laboratory whose fiftieth birthday you celebrate, as it developed under the guidance of Theobald Smith, has been duly commemorated during the day's ceremonies. Nor does time permit analysis of the many and significant contributions made by the State Board of Health between 1900 and 1914 and by the State Department of Health since 1914. Commissioners Allan J. McLaughlin, Eugene R. Kelley, George H. Bigelow, and Henry D. Chadwick added luster to its record, and we hail Vlado A. Getting as their worthy successor. In at least two fields, tuberculosis control and cancer control, Massachusetts is today in the very forefront of the profession.

It seems proper for us to go back to the glories of the public health decade of the 1890's and to consider what we may learn from that experience for the years to come. History should be not merely a fascinating pursuit for our less active moments, nor—even in the case of a celebration like ours today—primarily the stimulus to a comfortable sense of pride and satisfaction. The most important value we can derive from a study of the past is a better sense of direction for the future.

What, in essence, did Mills and Sedgwick and the rest do in those creative days after the reorganization of 1886? They looked—as it seems to me—at the State of Massachusetts and they said to themselves: "Our job is to promote the health of the citizens of this state. What menaces their

* Flint's N. Boston (N. Y.) outbreak was probably but not certainly due to well water and the Plymouth, Pa., epidemic of 1885 was not analyzed with sufficient clarity and force to carry universal conviction.

health? If we can find the causes which make for ill-health, what can we do to remove those causes?"

These questions they answered in the terms of their day and generation. The most obvious causes of preventable disease and death in 1890 were epidemic germ diseases like typhoid fever and diphtheria; and the way to control those germ diseases was to dispose of sewage, to purify water, to pasteurize milk, to immunize against diphtheria. Our fathers in the faith found the road and followed it; so that typhoid fever and diphtheria and infant diarrhea have become medical curiosities in Massachusetts.

There is just one way in which we can pay real tribute to the pioneers of 1869 and 1894. That is, to apply the same courage and vision which they once displayed to the problems of today.

Between 1900 and 1940, the death rates of the Registration Area for typhoid and diarrhea and for diphtheria and the other acute communicable diseases were reduced more than 90 per cent; the death rate for tuberculosis, 77 per cent; the death rate for pneumonia and influenza 61 per cent. The tasks set for us by Mills and Sedgwick and Theobald Smith have been almost accomplished. On the other hand, the mortality from all other causes than those mentioned has fallen by only 16 per cent. Today 27 per cent of all deaths are due to diseases of the heart, 16 per cent to other conditions associated with the cardiovascular-renal complex and 11 per cent to cancer. This is the challenge of today. How shall we meet it?

It is obvious that the solution of these problems is not simple and that no complete solution is possible. The human machine, like all other biological mechanisms, is wound up to run for a certain number of years. As its primary source of energy is exhausted, death inevitably comes; and this is, on the whole, a very sound arrangement, since it is the cycle of the generations which makes progress possible. We are still, however, far from the ideal set forth by that most fascinating of Boston physicians, Dr. Oliver Wendell Holmes, pioneer in the study of puerperal fever, teacher, poet, litterateur. The One-Horse-Shay which on the morn of its hundredth year

> "went to pieces all at once—
> All at once, and nothing first—
> Just as bubbles do when they burst"

is a parable of a health objective still unattained. Mortalities from heart disease of 152 at ages 45–54 and of 426 at ages 55–64, and mortalities from cancer of 168 at ages 45–54 and of 370 at ages 55–64 (U. S. 1940) are evidences, not of normal but of premature degeneration.

The mortality from diseases of this type is no doubt indirectly influenced by certain of our standard public health procedures. What we do to control streptococcosis and syphilis will be reflected in lower death rates from heart disease years later. In the main, however, direct control of such maladies as heart disease and cancer depends upon early diagnosis and upon treatment or a special regimen of personal hygiene based on that diagnosis—in other words, on good medical care. It is strange to hear, as one sometimes does, physicians deprecating any attempt to deal effectively with the provision of preventive medical service on the ground that people must die some day, that they might as well die of heart disease as of anything else, and probably will die of heart disease anyway. We may grant these premises and yet fail to agree with the implied conclusion that medicine is rather a needless luxury. If ten years of useful life can be gained by postponing a fatal (or a crippling) termination from the age of 60 to the

age of 70, the gain is real and significant.

The provision of good medical care for all the people is, then, a definite objective for the intelligent health officer. He knows that the lower half of the population from an economic standpoint has more sickness than the upper half and actually receives only half the medical care which it needs—and which the well-to-do family enjoys. He recognizes that this lack of medical care can be met only in one of two ways—either through direct provision of medical care by the state; or through a system of prepayment (voluntary and unsubsidized in the higher income ranges, compulsory and subsidized by the employer in the lower income ranges); or by a combination of these two methods.

It is for these reasons that the American Public Health Association at its Annual Meeting in October, 1944, adopted a formal statement of policy which included the following statements:

"A national program for medical care should make available to the entire population all essential preventive, diagnostic, and curative services."

"Services should be adequately and securely financed through social insurance supplemented by general taxation, or by general taxation alone."

"The services should be financed on a nation-wide basis, in accordance with ability to pay, with federal and state participation, and under conditions which will permit the federal government to equalize the burdens of cost among the states."

"A single responsible agency is a fundamental requisite to effective administration at all levels—federal, state, and local. The public health agencies—federal, state, and local—should carry major responsibilities in administering the health services of the future . . . with the advice and counsel of a body representing the professions, other sources of services, and the recipients of services."

"Private practitioners in each local administrative area should be paid according to the method they prefer, i.e., fee-for-service, capitation, salary, or any combination of these."

"The principle of free choice should be preserved to the population and the professions."

In this document,* the American Public Health Association has given us a clear and courageous program. It is peculiarly fitting that this Association has been the first of the expert professional groups concerned to formulate such a program; for the health officer represents, in a unique degree, professional knowledge on the one hand and community responsibility on the other. The Hippocratic oath binds the practitioner to the highest standards of service rendered to those individual patients who call upon his skill. The health officer is a physician who has undertaken, in his oath of office, the more far-reaching responsibility of planning for the health of the community as a whole. This responsibility has been met—with modesty, but with a compelling sense of public duty—in the adoption of the policy formulated in New York last October.

The challenge to the health officer of 1894 was to see that new knowledge of bacteriology and sanitary science was applied in the purification of water and sewage, the pasteurization of milk, the development and application of sera and vaccines for the treatment and prevention of disease. The task was well done. The historian of 1994 will judge the health leadership of today by the extent to which it puts the new knowledge of preventive and constructive medicine to work in dealing with the health problems which are, in 1944, of paramount importance.

Therefore, the health officer who has in him the spirit of the pioneers will conceive that one of his primary re-

* Medical Care in a National Health Program. An Official Statement of the American Public Health Association. *A.J.P.H.*, 34,12:1252-1256 (Dec.), 1944.

sponsibilities is to plan for putting the vast resources of modern medical science to work in his community. He should have the courage to make the facts of the situation clear to the lay public; and the statesmanship to secure the coöperation of the local medical profession in planning wisely so that quality of service can be insured—as it can only be assured—by the expert but coöperative direction of the professions concerned. To secure such coöperation will not, I suspect, be quite so difficult as the fulminations of the National Committee of Physicians might lead us to believe.

There are still wider vistas which confront the open-minded observer of trends in the field of public health. More and more, as the years pass by, we are realizing that health means more than a temporary postponement of the day when one's name is inscribed on a death certificate. Decreases in gross mortality rates will not be spectacular during the next half century. But health means ***health,*** quality and fulness of living; and in this respect progress can and must be great. Health includes mental and emotional health as well as continuance of the functions of heart and lungs. We know that nearly half of all the beds in all our institutions for the sick are occupied by patients suffering from mental and nervous complaints. We know that in the average family, handicaps due to emotional maladjustments are probably quantitatively equivalent to all the rest of the so-called physical handicaps from which such a family suffers. Mental hygiene is not a small sector of our problem, but more nearly half of it.

In the half century to come, then, the health officer must not be solely interested in syphilis and tuberculosis, or even in heart disease and cancer. He must, more and more, concern himself with nutrition in its subtle and complex influences upon vigor and efficiency and satisfaction. The absence of vitamins or iodine or fluorine in the diet of a community may seem as important as the presence of typhoid bacilli in its milk supply.

He must concern himself with housing, in its relations to the optimum physiological needs for warmth and coolness and light; to the avoidance of strain in the performance of household tasks and of the development of a sense of inferiority associated with life in a substandard dwelling; to the elimination of sanitary risks due to vermin and food spoilage and overcrowding; and to the control of the home accidents which kill 30,000 persons a year in the United States. He should lead in the elimination of substandard dwellings and participate actively in the planning for slum clearance, urban redevelopment, and low-rent housing.

He must concern himself with the living wage and with the provision of a due measure of social security, which is essential to both physiological and psychological health.

In other words, public health which in its earliest days was an engineering science and has now become also a medical science must expand until it is in addition a social science.

I do not underestimate the difficulties in the way of this new stage in the expansion of our professional tasks. As a social science, public health must cruise into waters which are new and stormy—and infested with sharks. The typhoid bacillus had no friends; but the insanitary tenement has many; and outmoded systems of medical practice seem to have a few. We shall need wisdom and intelligence to pilot our bark, and courage and determination to undertake the voyage.

Yet have we not still the temper of the reformer in the very life-blood of our tradition?

John Simon in his first report as Medical Officer of the City of London nearly a century ago had this to say:

> In the great objects which sanitary science proposes to itself,—in the immense amelioration which it proffers to the physical, to the social, and indirectly to the moral condition of an immense majority of our fellow-creatures, it transcends the importance of all other sciences, and in its beneficent operation seems most nearly to embody the spirit and to fulfil the intentions of practical Christianity. Ignorant men may sneer at its pretensions; weak and timorous men may hesitate to commit themselves to its principles, so large in their application; selfish men may shrink from the labour of change, which its recognition must entail; wicked men may turn indifferently from considering that which concerns the health and happiness of millions of their fellow-creatures. To such men an appeal would indeed be useless. But, to the Corporation of the City of London—whether as assembled in its entire Parliament, or as represented within the confines of this Court —to the Corporation which, on so many occasions, has attained patriotic ends by great expenditure and sacrifice; to men earnest, strong-minded, and practical, having much consideration for their fellow-creatures, and having little consideration for personal toil or municipal expense, so only that they may fulfil a great Christian duty, and may confirm the gratitude with which history records their frequent services to our kind;—to such a Corporation, and to such men, the Country looks for the perfection of a sanitary scheme which shall serve as model and example to other municipal bodies undertaking the same responsibility; and to such a Corporation and to such men do I, likewise, your Officer of Health, respectfully and confidently address a well-founded appeal.

The sanitary leaders of Massachusetts, half a century ago, used less florid language; but theirs was the self-same spirit. Mills and Smith and Sedgwick transcended the currently-accepted responsibilities of their time. They saw the evils which actually existed; and they attacked them with vision and with courage and with success. The health officers of 1944 must meet the specific challenges of the present hour with the same spirit.

I was talking some months ago with a health administrator who raised the question how the work of the health officer could be so dramatized as to touch the popular imagination and arouse in the public mind a sense of what health service really means. The famous picture by Fildes of the doctor by the bedside has brought to millions a sense of what the service of the practitioner means to the individual. Can the benefits conferred by a good health department be similarly vivified and warmed by the emotional color which their values truly justify?

Generally speaking, I think the answer is "No." It is difficult to dramatize what does not happen. The fact that purification of a water supply has saved thousands of lives is a statistical fact but not an emotional appeal. Drama depends on a conflict; and a conflict between forces which can be expressed in tangible form. In the social aspects of public health, however, there are opportunities for just and pertinent dramatization; there are conflicts for the body and soul of man which are concretely representational. When Bundesen fought the milk dealers and the brothel keepers of Chicago, there was drama. When Craster of Newark and Graves of Memphis and Williams of Baltimore attacked the slum, there was drama. When La Guardia and Stebbins launch the program of prepaid medical care in New York City there will be drama. (Wherever La Guardia is, there is always drama.) So, if the tasks of the new social public health are dangerous and difficult, you will find powerful allies at your side.

I do not, however, urge you to attack the tasks of the future in public health because it will be popular to do so. Nor do I wish to stress the fact that the future status of our profession depends on your answer to the social challenge—though such is the fact. If we continue merely the

routine activities of the past, the health officer will be merely a cog in an essential but undistinguished administrative machine; only with a bold approach to meet the new demands of the time shall we earn the sense of real achievement which comes to the pioneer.

But my real appeal is to your sense of the responsibilities of the high office to which you have been called. To the health administration of a city, a state, or a nation, its citizens turn for leadership. So far as health is concerned, it is to you that the returning soldier will look for a world in which he can live a life worthy of his sacrifice. It is to you that the mother will look for a world in which her children can grow up to the fulness of being. You stand on the watchtower as their trusted guardian. If your eyes are open you realize that the conditions of such a world include more than a safe water supply and a tuberculosis sanatorium and a child welfare clinic and a diphtheria immunization program. They involve also a decent standard of living for all the people in the community. They include a minimum wage, food, housing, medical care, social security. You have the clear duty of reporting what you see from your watchtower. You should be not only the prophets but the guides into that Promised Land where blossoms "the tree of life, which bare twelve manner of fruits, and yielded her fruit every month: and the leaves of the tree are for the healing of the nations."

Typhus Commission Medal

The Typhus Commission Medal was recently awarded to Brigadier General Leon A. Fox, MC, USA, for "exceptionally meritorious service rendered first as director and later as field director of the United States of America Typhus Commission." According to *Science,* General Fox directed the Typhus Control Project at Naples in December, 1943, which in one month brought the epidemic of that disease in southern Italy under control.

Bacteriological Improvements Obtained by the Practice of Break-Point Chlorination*

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NO other process of water purification has had such an astounding growth as the disinfection of water by chlorination. This growth began when bleaching powder or hypochlorite of lime was applied to the Jersey City water supply on a continuous basis at Boonton, N. J., in 1908. The outstanding results obtained with the process and the conditions existing at the time were contributing factors to this rapid expansion.

Experiments conducted at the time by eminent water purification and public health authorities such as Professors Mason, Kinnicutt, Park, Westbrook, Drs. Leal and McLaughlin, and Mr. Johnson, on the coliform and typhoid organisms in water gave identical results—in each instance the organisms were destroyed by bleach. To them it was surprising that the small quantities of hypochlorite used were sufficient to kill pathogens.

As a result of the success obtained by these experiments and the acceptance of the disinfection process by the courts, attention was immediately focused upon the process. The interest created was without doubt materially accelerated by the numerous typhoid fever epidemics then so prevalent in the United States. The enthusiasm for the disinfection process was best expressed by Leal, one of its most ardent advocates, who in 1909 said that "the practical application of the use of bleach for the disinfection of water supplies seems to be a great advance in the science of water purification. It is so cheap, so easy and quick of application, so certain in its results, and so safe, that it seems to cover a broader field than does any other system of water purification yet used. It cannot but conduce to the economic and physical benefit of mankind."

As one looks back upon that era, the growth of the process of treatment was almost phenomenal, particularly when compared to the processes of water purification then in existence. Slow sand filtration was installed at 30 water treatment plants between 1875, the year of its introduction in this country, and 1914, a span of 39 years. This was at the rate of less than one plant a year. Rapid sand filtration, often in conjunction with coagulation, was installed in 450 water treatment plants between its introduction in this country in 1885 and 1914, a span of 29 years. This was at the rate of about 15 plants a year. By comparison, the disinfection of water by bleaching powder or hypochlorite of lime was installed as a

* Presented before the Engineering Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

process of treatment in over 300 water treatment plants from late 1908 until 1913, a span of 5 years. This represents a growth of 75 plants per year.

By 1913 it was evident that chlorination, as a process of water purification, was firmly established. The introduction of liquid chlorine during this same year gave further impetus to its use. Thereafter, the process expanded so rapidly that it became impossible to ascertain definitely the number of plants using chlorination. By its use tremendous bacteria reductions were being obtained and the typhoid death rate dropped to an unexpected low. For many years thereafter nothing more, from a bacteriological standpoint, was desired. Chlorination of the water to a small definite chlorine residual sufficed to produce the spectacular results.

With increased experience in chlorination practices it was noticed, on occasion, that coliform organisms were growing in the distribution system, ofttimes in the presence of substantial chlorine residuals. In some instances, as outlined by Cox[1] "borderline" chlorination, now identified as marginal chlorination, should be considered as positively dangerous. He substantiates this by pointing out the experiences in City X where, during the course of a typhoid epidemic, chlorination apparently was removing coliform organisms, but the "paracoli," that is, the "late lactose fermenting organisms," were not destroyed and were isolated from the distribution system. He further shows that in another instance, in City Y, during the course of a gastroenteritis epidemic, the chlorine dosage was carried as high as 4.75 p.p.m., and then reduced to a residual of 0.4 with sulfur dioxide in an effort to stem the epidemic. In the latter case there is no record of the effect of such treatment on the "paracoli" concentration. That such organisms existed there can be little doubt, for an examination of more recent records from the same city shows that a considerable portion of the 10 ml. tubes planted from distribution samples have contained nonconfirming gas-forming bacteria.

Coincident with the development of tests showing the relative concentration of free available chlorine and chloramine residuals, the application of chlorine, at City Y, was raised from an average of 1.5 p.p.m. to 4.2 p.p.m. This increase produced a free available chlorine residual of 1.0 p.p.m. in the water leaving the plant. This change in operating procedure brought about such a drastic reduction in "paracoli" content of the city water that until currently it is the exception rather than the rule to find even a cloudy tube in the distribution system samples.

Repeated experiences of similar nature prompted the study by Levine, Carpenter, and Coblentz,[2] in 1938 and 1939, of 162 cultures from 97 water samples from five cities. This was undertaken to study the characteristics of organisms (presumably of the coliform group) growing in the reported presence of chlorine residuals. They concluded that chlorine residuals of 0.2 to 0.04 p.p.m., as determined by the orthotolidine technique of that time, could not be considered a dependable criterion of adequate water sterilization.

Faber[3] in 1939 commented "There is an insistent demand for the production of water which will meet standards of bacterial quality even more rigid than those standards adopted by the U. S. Treasury Department." The controlled super-chlorination process, known as break-point chlorination, offered, according to Faber, one means of attaining a higher standard of bacterial purity in the finished product.

These observations by men experienced in the field of water purification seem to have represented the general opinion prevailing in the field at that

time and served as a basis for research work into the killing velocity of free available chlorine residuals versus chloramine residuals, the mechanism of the reactions between chlorine and ammonia in dilute solutions, and methods of control to obtain and maintain the various types of residuals.

Schmelkes, Horning, and Campbell [4] showed that free available chlorine will kill bacteria within a very few seconds, and a year later Weber, Bender, and Levine [5] reported that free available chlorine will kill spores of mentiens within 3 minutes but that chloramines of the same magnitude require up to 90 minutes. This work was quickly confirmed by Streeter [6] on a scale more nearly approximating plant operating conditions. Concurrently with these researches along bacteriological lines Laux,[7] Laux-Nickel,[8] Keineth,[9] Marks and Glass[10] Moore,[11] and Hallinan [12] developed simple and usable tests for the detection and differentiation of free available chlorine and chloramine residuals. These tests paved the way for the production and control of free available chlorine residuals without the earlier drawbacks of over-chlorination which so often leads to the necessity of dechlorination.

Out of this abundance of new information regarding the application and control of chlorine there arose gradually a new concept of chlorination known as "Break-Point." [13] This process takes advantage of the fact that the production and maintenance of free available chlorine residuals will produce superior bacteriological results and often will produce a better tasting water. Thus in 1939 and 1940 the stage was being set for a real advance toward the complete eradication of bacteria in water supplied to the public.

The reluctance to increase the rate of chlorine application several fold, even though this might not amount to more than 1.0 or 2.0 p.p.m., was quickly dispelled by the experience of one operator [14] who applied 110 p.p.m. and thereby rendered an otherwise unsafe and undrinkable water, not only safe but usable. But in 1940 insufficient data had been accumulated to make a true evaluation of the real worth of free available chlorine residuals. Now that the process has been in use at many plants over a period of years, such data are available and have been tabulated for a number of plants.

Examples of these are presented below. They indicate the sort of results than can be obtained under a variety of operating conditions.

Throughout the test and on the various charts the term Index per 100 ml. has been used to designate the density of gas-forming bacteria. Although it is recognized that such a method may not be precise from a mathematical viewpoint it is particularly well adapted to the comparison of thousands of results. An index of zero, wherever it appears on a chart, means that no gas was produced in any of the samples tested during that period.

CASE A

Water for this plant is obtained from a reservoir into which a small amount of domestic waste is discharged. The

TABLE 1

Case A—Bacteriological Data

Finished Water (At Laboratory Tap)

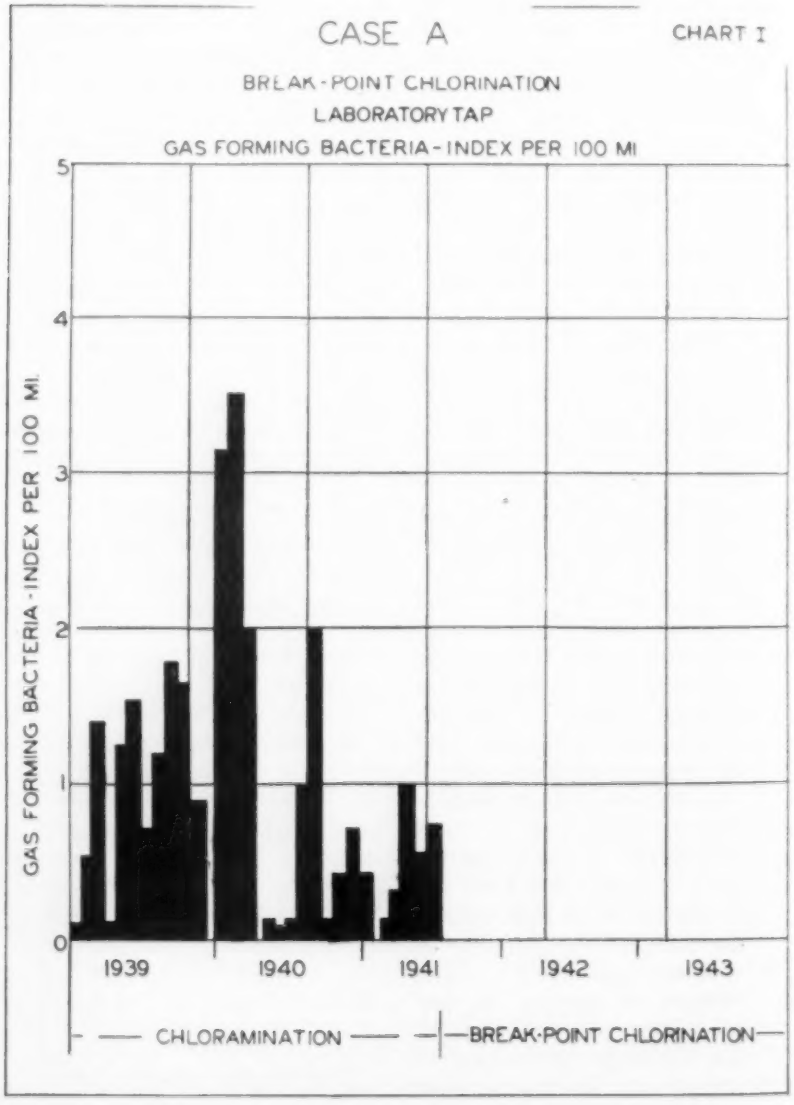
	10 ml. Lactose Broth Tubes			
Year	*No. Planted*	*No. 48 hr. Gas*	*Per cent Showing Gas*	
1939	1,660	158	9.5	
1940	1,640	196	12.0	9.4
1941 *	945	45	4.8	
1941 *	690	0	0	
1942	1,485	0	0	0
1943 †	1,135	0	0	

* Break-Point Chlorination started August 1
† For the year through August 31

plant capacity is 2.5 m.g.d. Operation is intermittent. Treatment consists of coagulation with alum and lime followed by settling and filtration.

The bacteriological results, before and after the adoption of break-point chlorination, show the excellent results that can be obtained when the plant is properly controlled to produce and maintain a free available chlorine residual throughout a plant and into a distribution system.

In Table 1 it is to be noted that during the 2½ years prior to the use of break-point chlorination i.e., during the time when chloramination was being used, 9.4 per cent of all of the 10 ml. broth tubes planted on the finished water, as sampled at the laboratory tap, showed gas formation. During the



first 2½ years of break-point chlorination not a *single* 10 ml. portion of the finished water, as sampled at the same point, produced gas.

The gas-forming bacteria index per 100 ml. for the finished water for the same periods is shown on a monthly basis in Chart I. It is to be noted that the gas-forming bacteria index per 100 ml. is zero for each month since break-point chlorination was started at this plant in 1941. The chlorine requirement that made possible these results is most interesting. During the chloramination period shown, the chlorine applied to the raw water averaged 2.49 p.p.m., and the chloramine residual was often as high as 1.00 p.p.m. in the finished water. During the break-point chlorination period shown the chlorine applied to the raw water averaged 3.67 p.p.m. and the free available chlorine residual in the finished water averaged 0.75 p.p.m. By increasing the chlorine applied to the raw water by less than 50 per cent or about 1.20 p.p.m. and eliminating the ammonia applied, it has been possible to alter the residual from one that is definitely chloramine to one that is definitely free available chlorine. The change has resulted in the eradication of the gas-forming bacteria, as indicated by the absence of gas in all 10 ml. portions of the finished water planted in lactose broth.

CASE B

Water is obtained from a sizable river located near one of the more highly industrialized sections of the country. The river receives considerable domestic and industrial pollution. The plant capacity is 5 m.g.d. Operation is continuous. Treatment consists of coagulation with lime followed by settling and filtration. Occasionally lime and carbon are added. Pre- and post-chlorination have been common practices for many years. In this there has been no change as operation has shifted from marginal to break-point chlorination and back again.

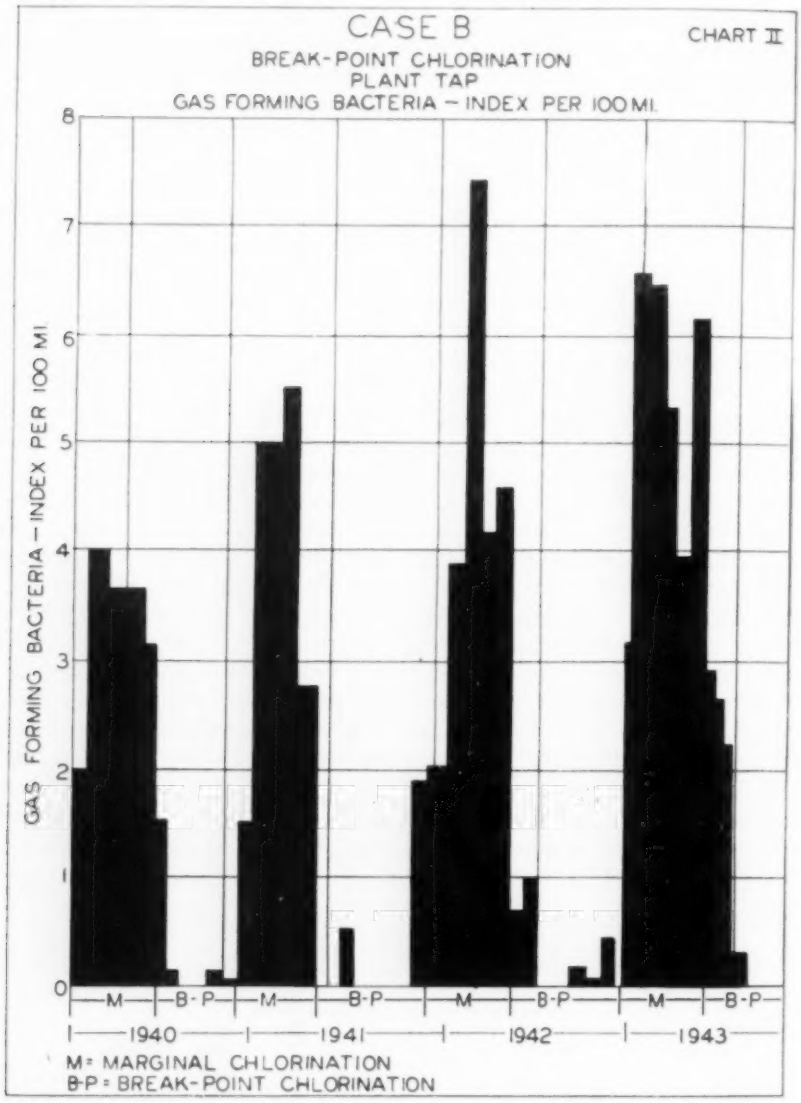
One of the most striking examples in bacteriological improvement through the use of break-point chlorination is shown in this case. At this plant marginal chlorination is used during the winter months and break-point chlorination during the summer months when

TABLE 2

Case B—Bacteriological Data

Finished Water (At Plant Tap)

Periods	*10 ml. Lactose Broth Tubes*		
	No. Planted	*No. 48 hr. Gas*	*Per cent Showing Gas*
Marginal Chlorination			
January, 1940, through May, 1940	650	212	32.6
December, 1940, through April, 1941	645	249	38.6
December, 1941, through April, 1942	630	299	47.5
December 17, 1942, through May 15, 1943	640	348	54.4
Total of Four Periods	2,565	1,108	43.2
Break-Point Chlorination			
June, 1940, through November, 1940	750	21	2.8
May, 1941, through November, 1941	955	28	2.9
May, 1942, through December 16, 1942	970	29	3.0
May 16, 1943, through September, 1943	575	85	14.8
Total of Four Periods	3,250	163	5.0
Total Omitting First Month of Each Period	2,740	104	3.8
Total Omitting First Two Months of Each Period	2,245	41	1.8



taste and odor control is required. If the primary reason for such treatment had been one of bacteriological control, there is little doubt, from the results obtained (see Table 2 and Chart II) that break-point chlorination should have been used at all times, since the gas-forming bacteria index per 100 ml. of the raw water usually varies throughout the entire year from 5,000 to 10,000.

In Table 2 it is to be noted that during the four periods of marginal chlorination, 43.2 per cent of all of the 10 ml. broth tubes planted on the finished water, as sampled at the plant tap, showed gas formation. In comparison with this it is to be noted that only 5.0

per cent of all of the 10 ml. broth tubes planted on the finished water, as sampled at the same point, produced gas. The chlorine requirements during the periods of marginal chlorination, when the residual was chloramine, averaged 1.44 p.p.m. During the break-point chlorination periods the chlorine requirements averaged 5.49 p.p.m. The increased use of chlorine may have been a factor for not using the process on a continuous basis, although it seems that the improvements accomplished, although not excellent in regard to the percentage of tubes still showing gas, was worth the effort and should not be measured in dollars and cents.

Normally, when a plant is on break-point chlorination the percentage of total 10 ml. broth tubes showing gas is much less than 5.0 per cent. In this particular case, the percentage of tubes producing gas would have been much less had the plant stayed on this method of treatment continuously.

Evidence of this is furnished both in Chart II and Table 2. In Chart II, showing the gas-forming bacteria index per 100 ml. on the finished water on a monthly basis, it is indicated that the plant was on break-point chlorination for a total of 25 months during the four periods under consideration. For 11 of the 25 months the index was zero, and, with the exception of the year 1941, none of these occurred during the month the plant went from marginal to break-point chlorination. In the remaining 14 months which had a positive index, 3 occurred during the first month of each period and 7 occurred during the first two months of each period. The elimination of the first month or even the first two months from the records during the periods of break-point chlorination should, therefore, result in a much better index; in fact, it should indicate the sort of results to be expected had the plant been on this treatment continuously.

These data are compiled and appear on the last two sets of figures given in Table 2. By eliminating the number of tubes showing gas during the first month of each period, only 3.8 per cent of all of the tubes during the break-point chlorination periods showed gas. In other words, 36 per cent of all of the tubes showing gas during the four complete periods occurred during the first month of each period. By eliminating the number of tubes showing gas during the first and second month of each period, only 1.8 per cent of all of the tubes during the break-point chlorination periods produced gas. In other words, 75 per cent of all of the tubes showing gas during the four complete periods occurred during the first two months of each period.

One suggestion as to the cause for such a large portion of the gas-forming bacteria showing up during the first month of each period is that the control was improper due to operators refamiliarizing themselves with the control of break-point chlorination or new operators familiarizing themselves with the process of treatment for the first time. However, since the second month showed gas to a similar degree, it is evident that the cause must be found elsewhere.

Each time a plant goes on break-point chlorination, the free available chlorine is consumed in stabilizing the sludge in the settling basin, and in consuming organic matter in the filters during such time carbon is not in use. Each time a plant reverts to marginal chlorination the improvements established in a plant cease to exist. Each time the plant goes on break-point chlorination a free available chlorine residual is obtained in the raw treated water and for some time thereafter, but a free chlorine residual cannot be as easily maintained throughout the plant due to its continued consumption by the sludge on

the settling basin, the organic matter in the filters, and by carbon that may be applied.

Therefore, if a free available chlorine residual is maintained at the head of the plant, equal to that normally used when the so-called chlorine demand of the plant has been satisfied, it will be some time before a free available chlorine residual can be maintained throughout the plant due to its consumption in satisfying this demand. This demand can be satisfied quickly by using more than normal amounts of free available chlorine for the first few days of operation. Failure to do this, as in this case, results in the continued growth of more than normal numbers of gas-forming bacteria in the finished water during the first few weeks of break-point chlorination. This indicates that it is better to stay on break-point chlorination once it has been established than to use it intermittently.

CASE C

Water is drawn from a river containing large amounts of domestic and industrial wastes. The quality of the water is subject to wide and sudden changes. The average daily output from the plant is 10 million gallons. Operation is continuous. Treatment consists of coagulation with alum and lime followed by suitable settling and filtration. Chlorine is applied along with the coagulating chemicals. Post-chlorination is used as required to maintain the proper magnitude of chlorine residual in the plant effluent. Pre-ammoniation is used to smooth out the free ammonia content of the water arriving at the plant. This has the effect of stabilizing the chlorine requirements. The process is known as induced break-point chlorination.

Although a well developed plan may call for continuing the plant on break-point chlorination, it occasionally happens, due to a variety of circumstances, that the plant must go off the process. That this should be avoided, if at all possible, is seen in Case C. Here it was necessary to revert to marginal chlorination during the installation of additional equipment. This plant went off of break-point chlorination in 1941 for 21 days in September, 23 days in November, and all of December. In 1942 this occurred again for 10 days in January and 4 days in July. The effect of these shut-down periods is reflected in the bacteriological results as indicated by the cross-hatched areas in Chart III.

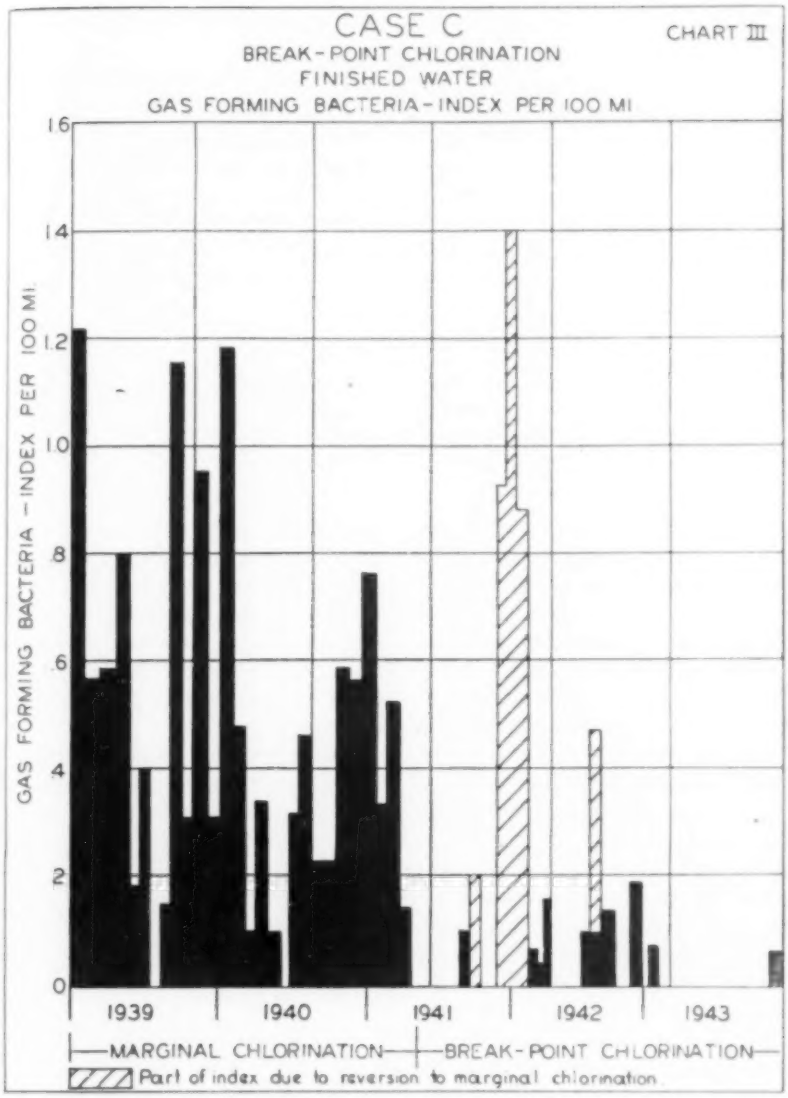
It is to be noted here that, during marginal chlorination, 4.5 per cent of the finished water 10 ml. broth tubes showed gas. From the time break-point chlorination was started in May, 1941, until December, 1943, 1.7 per cent of the finished water 10 ml. broth

TABLE 3

Case C—Bacteriological Data

Finished Water

	10 ml. Lactose Broth Tubes		
Periods	*No. Planted*	*No. 48 hr. Gas*	*Per cent Showing Gas*
Marginal Chlorination			
January, 1939, through April, 1941	4,350	196	4.5
Break-Point Chlorination			
May, 1941, through November, 1943	4,715	81	1.7
Break-Point Chlorination			
less installation periods	4,270	14	0.3



tubes showed gas. If the shut-down periods during this time are taken into account, only 0.3 per cent of all of the broth tubes for the finished water showed gas. In other words, when the plant was definitely on break-point chlorination it was removing more than 90 per cent of the gas-forming bacteria in the water not removed by marginal chlorination. These shut-downs had, therefore, spoiled what otherwise would have been an excellent record of accomplishment and indicates that breaks in chlorination procedure should not be tolerated.

CASE D

Water for this plant is obtained from a small river. There are no industrial plants on the drainage area and only

TABLE 4

Case D—Bacteriological Data

Raw Water

		10 ml. Lactose Broth Tubes			
Year	*Raw Water Turbidity*	*No. Planted*	*No. 48 hr. Gas.*	*Per cent Showing Gas*	
1937	208	205	85	41.6	
1938	153	150	69	46.0	
1939	198	175	62	35.4	38.3
1940 *	135	110	29	26.4	
1941	145	1,025	60	5.8	
1942	244	1,750	40	2.3	4.0
1943	255	1,910	89	4.7	

* Break-point started August 1, 1940

a small amount of domestic waste enters any of the streams thereon. The bacterial content of the river water at the intake is, however, quite high due to farm drainage. Turbidities are quite high. The capacity of the plant is 3.0 m.g.d. and operation is intermittent. Treatment consists of coagulation with alum and lime followed by settling and filtration. Activated carbon and copper sulfate are added occasionally to combat algal growths. Chlorine is added along with the coagulating chemicals and to the filtered water.

The results obtained at this plant, while by no means perfect, must, in the light of difficulties encountered, be considered good. During the four years preceding the adoption of break-point chlorination 38.3 per cent of all of the 10 ml. broth tubes planted showed gas. During the three succeeding years this figure dropped to 4.0 per cent (see Table 4).

It is to be noted that the new mode of operation was started about August 1, 1940, and that this had a very beneficial effect on the number of gas formers found during that year. In analyzing these data the turbidity of the raw water must also be taken into consideration because of its effect on the overall operation of the plant. During 1942 and 1943 the turbidity of the river water was exceptionally high, but in spite of this the gas formers in the finished water remained exceptionally low. In former years a higher incidence of gas formers would have been expected.

The amount of chlorine required to accomplish these results was somewhat greater than formerly.

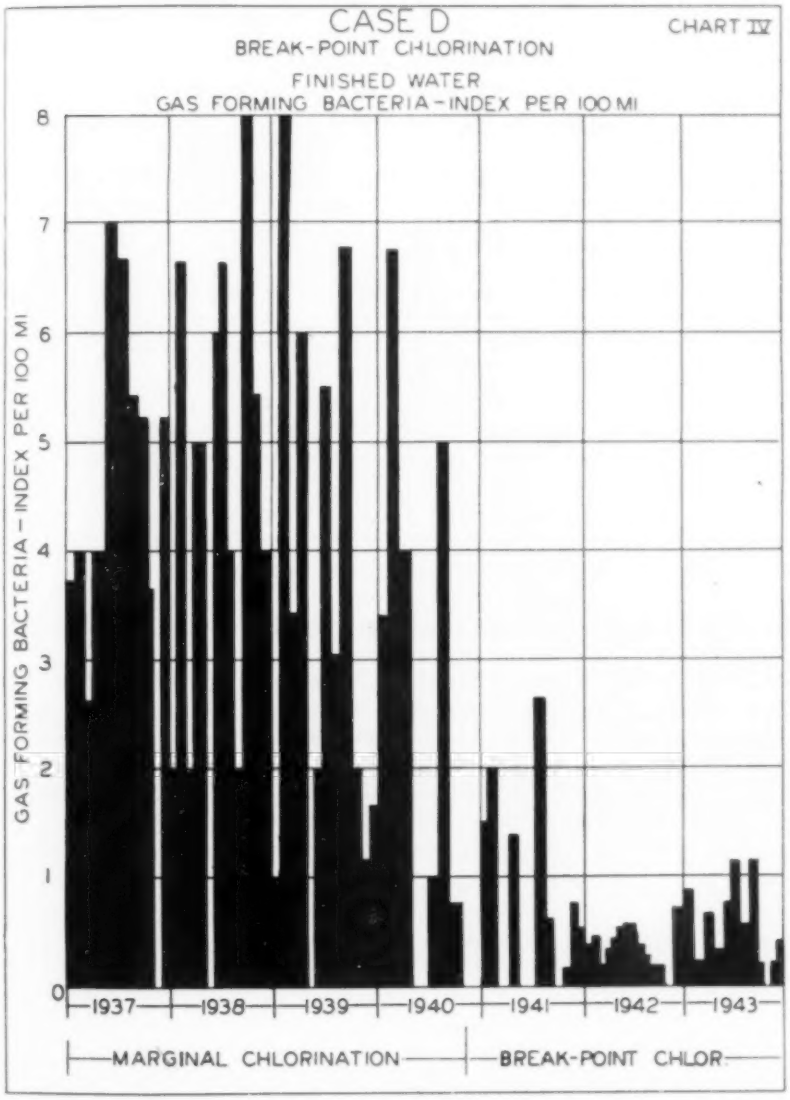
TABLE 5

	Chlorine Applied p.p.m.	
	Prior to August, 1940	*Subsequent to August, 1940*
Maximum	2.1	3.2
Minimum	0.3	0.7
Average	1.06	2.03

Chart IV shows the gas-forming bacteria index per 100 ml. by months from January, 1937, to December, 1943, inclusive. It is to be noted that prior, i.e., before break-point chlorination was started, the index of presumptives present rose and fell without relation to any single factor. Frequently none was present at any time during the month and at others they amounted to an index of 8.0. It is possible, although there is no confirming proof, that during the periods when none appeared the chlorine resid-

ual was in the form of free available chlorine.

Subsequent to August, 1940, an attempt was made to apply the chlorine in such amounts that the residual would consist of free available chlorine alone. That this was not always accomplished is self-evident. From August through December, 1940, good results were obtained, but for the next six months difficulty was encountered. The tests employed were not specific and the operators at the plant did not understand the necessity of adding so much chlorine. From August, 1941, a better degree of control was obtained, but still the results were not as good as they could have been. Since January, 1944, results not shown, the operators have caught the spirit of the process



and the gas formers in the finished water are approaching the vanishing point. It is presumed that, had perhaps an average of 0.5 p.p.m. more chlorine been added during this entire period, all of the gas formers would have been removed. These experiences indicate the value of a full understanding of the control tests developed during the past few years and the necessity of maintaining adequate chlorination facilities to meet extreme fluctuations in chlorine demand.

In summary it appears from the data accumulated that:

1. It is possible to eradicate all late gas-forming bacteria from water.
2. Bacteria in water can be eliminated without impairing the taste and odor qualities of the water.
3. Continuous maintenance of free available chlorine residual is highly desirable.
4. Ammonia can be used to induce a break-point.
5. Induced break-point chlorination simplifies chlorination where the free ammonia content of the water is subject to wide and sudden variations.
6. Full use should be made of the control tests now available.
7. Adequate chlorinator capacity should be maintained to meet unexpected increases in chlorine demand.

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Admiral Stitt Receives Tropical Medicine Medal

The award to Rear Admiral Edward R. Stitt, USN, Retired, of the gold medal of the American Foundation for Tropical Medicine was announced in New York in February for his contribution in tropical medicine. The award was made by Colonel Richard Pearson Strong, Director of Tropical Medicine at the Army Medical School, Washington, who received last year's award. Major General George C. Dunham, attached to the Office of the Coordinator of Inter-American Affairs, was a speaker at the time of the award.

Influence of Psychological Factors on the Nutrition of Children*

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THE state of nutrition of an individual is not fixed. Although the average healthy person becomes stabilized in body size and proportions during adolescence and remains so until the influences of aging become increasingly effective, the processes of nutrition being dynamic are in flux in all age periods. This may be stated more directly; namely, appetite and hunger, ingestion, digestion, absorption and assimilation of food, and elimination of waste products—which result in the state called nutrition—are ever changing. But the person in good health is unaware of these fluxations in metabolism and is conscious only of the end results, that is, whether he is well or poorly nourished. When deviations in these processes occur a person may become aware of it because of symptoms of illness or, when pathology is sustained, by detecting gross changes in general nutrition.

The agents which influence the processes of nutrition are many, and may be variously classified, as, for example, exogenous and endogenous, chemical and physical, cultural and economic, and so on. These influences are commonly interrelated and always contain psychological elements as well. In fact, the psychological components may be the dominant forces which directly or indirectly bring about greatest change. For example, a family may have much money or little money, yet cultural habits determine how the money is spent for food because the persons buying and eating it have distinct *feelings* in the matter. It is also well known that emotional attitudes determine the amount of food taken and the rate of digestion. Affective states are now considered as part of the total reaction of the organism to external environmental situations as well as to internal conditions. Factors which are chemical or physical, or exogenous or endogenous, may bring about changes in physiological mechanisms which in turn set up emotional states, and if these are deep and of sufficient duration, contribute new chemical and physical effects through the endocrine and vegetative nervous systems. Studies in psychosomatic medicine have shown that no single emotion or special groups of feelings are responsible for modifying physiological states. Joy, sorrow, love, anger, hatred, resentment, and many others, all are capable of producing noteworthy effects. It is rather the degree and chronicity of the emotional tension which predicates the morbid effects.

Every intelligent person, however little his knowledge about physiological

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and psychological functioning, recognizes the close relationship between mind and body; one person learns from repeated experience that his own reaction to anxiety is loss of appetite, while to anger it is one of facial palor and sweating. One individual knows that his reaction to fear is vomiting, while another responds by frequency of urination. Each person seems to have his own pattern of reaction to emotional states. The adult seldom realizes that this specific pattern may have had its origin in infancy (and possibly in fetal life) and that the baby and child are even more susceptible to emotional influence than the full-grown person. It is the purpose of this paper to emphasize the impressibility of the infant and young child to emotional influences and to suggest measures of child care which will enhance opportunities for healthy growth and optimal nutrition.

The educator, physician, nutritionist, and the nurse working with infants and children, and especially parents, are in positions which lend themselves to careful and detailed long-term observations and study of growth and development, permitting appraisal of influences which help or hinder such processes. From reports of long-term studies of the development of children and from clinical observations in pediatric and psychiatric practice it is evident that feeding is the focus of the first emotional relationship between mother and child, and that the prenatal, neonatal, and later infancy periods are critical times for the individual, not only in terms of his nutrition, but in general well-being as well.

THE NEW-BORN PERIOD

The pediatrician in his practice repeatedly sees instances where failure to institute a good feeding pattern soon after birth continues to disturb baby and parent not only in eating, digesting, and eliminating, but in the areas of sleeping and general behavior as well. It is discouraging to find then, that most physicians and nurses emphasize the importance of good prenatal care, but consider it satisfactory if the pregnant woman is cared for in terms of her health and diet without paying equal attention to her attitudes about infant care, especially feeding, and that psychological preparation for nursing and detailed breast and nipple care receive little or no attention.

The older pediatrician, and more recently the child psychiatrist, recognize the value of breast feeding for its psychological as well as nutritional influence. The mother who wants to nurse her baby and is physically able to do so realizes that the processes of nutrition function smoothly because she has enough milk to satisfy her baby's appetite and because she is able to be calm and happy while nursing him. The baby is satisfied because his hunger pains are relieved and because the affectionate cuddling and sucking satisfaction put him at ease, and even have a soporific effect so that food digestion and absorption proceed smoothly and uneventfully. The bottle fed baby may also have these benefits of a good start in life if his mother imitates carefully the techniques of good breast feeding.

Attitudes in the mother and the attending medical and nursing personnel, therefore, constitute the first psychological influences on nutrition of the child. If for some reason the newborn is unable to be satisfactorily fed, disequilibriums of nutrition rapidly follow which may produce severe systemic effects such as weight loss, dehydration, and diarrhea. Needless to say, such babies and their mothers cannot be either happy or secure and each becomes irritable, tense, anxious, sleeps poorly, and may have long periods of crying.

As the problems of early feeding are corrected, improvement will be reflected in a return to health, good nutrition,

and feelings of well-being, especially when attention is not focused solely on food prescription and eating. The new-born period thus constitutes a period of potential danger to physical and emotional health. If weathered successfully because good feeding practices are instituted by an understanding and loving mother who has insight into the needs of her child, there will result a relationship between them which will be supportive to both at future times of stress, and the feeding processes will become a matrix for healthy development not only in nutrition but in sleep patterning, and motor and social development.

FIRST SOLID FOOD—THREE TO SIX MONTHS

The new-born period is only the first of several phases when aggregations of problems in child rearing and development present themselves. The age of the first 3 to 6 months is recognized by the pediatrician as another vulnerable epoch in the life of the healthy baby when psychological states seem especially to influence eating, feeding, and nutrition. This is the time for introducing solid foods. The mother who is concerned only with caloric values and food intake soon learns from the resistance of her child that the techniques of offering him foods are as important as the chemical constituents of the foods. Force of an active or passive variety by the mother will stimulate fear, resistance, and anger, and result in little new food being ingested and probably much food being ejected. Emphasis on "training a child to eat" tends to provoke disinterest in food and eating, while calm experimentation when the individual baby is ready for this new growth experience will bring feelings of satisfactions in achievement to him and wonderment and delight to the mother, and again the bond in mother-child relationship is strengthened and foreshadows success in the next period of feeding change.

WEANING AND OVEREATING

Although emancipation of the infant from his parents is a gradual and progressive period beginning at birth, the signs of struggle incident to freeing the organism from mother ties first become strongly evident in the period of weaning from breast and bottle. The ideal time of weaning is when the infant is ready for it, not only nutritionally but also psychologically, and, like all periods of his growth, this one may be delineated best by distinguishing characteristics in emotional, personal and social, and motor development rather than by chronological measurement.

At the time of weaning from breast and bottle, which is some time near the end of the first year of life or well into the second year, physical and psychological changes are extensive; emotionally the individual is no longer a little baby nor is he much of a child; he is in a sort of No-Man's-Land of Babyhood. Psychologically he is still very dependent upon his mother, yet he fights her for independence, and his daytime activity is frequently characterized by vacillations between being a tiny baby and a miniature adult. It is in this period, as in the later puberty and adolescence, that often we see food used as the symbol of emotions, and eating endowed with rich fantasy formation. For example, food offered by a mother to a child in distress is frequently accepted and found comforting by him since it appears as part of the mother herself; such a pattern of bringing relief to a child may have been started in early infancy without the production of noticeable changes in nutrition. It may become a habit at any time of childhood and adolescence, often arrived at quite accidentally and spontaneously when the individual finds easement of anxiety by the taking of food.

Changes in nutrition result when the emotional dysfunction is of long standing and when such a child becomes a chronic overeater. So often obesity brought about in this manner is contributed to by lessened physical exercise when the child withdraws from activity because of his feelings of unhappiness.

At any period of change in a child's life, whether it be at a time of undergoing a new experience such as starting school or adjusting to the birth of a sibling, food may be demanded as assurance of parental support and affection. In the life of the average child his need for such assurance is infrequent and of short duration and little change in the state of his nutrition results. But again where the individual feels more or less constantly in need of proof of parental love and where his feelings of anxiety, unhappiness, and insecurity are deep set and chronic and stimulate him to eat too much and too often, an imbalance of nutrition may become manifest as obesity. Similarly, an aggressive attitude on the part of an oversolicitous and anxious mother of a child who is convalescent from illness, forcing him to eat will often lead to a distaste for food and terminate in prolonged anorexia and malnutrition.

GUIDANCE FOR THE WELL CHILD

It is inevitable that the stresses and strains of normal growth cause problems in the life of every child and in his relationship with his parents. Some of these problems and the age periods of usual occurrence have been cited above. To the members of the American Public Health Association the important consideration is, "What may be done to insure a minimum of these problems, to prevent the occurrence of severe, prolonged, and recurrent difficulties, not only in nutrition, but in other aspects of development, behavior and personal-social relationships?"

After much reflection of this question, it appears to the experienced pediatrician that care of the mother before the baby's birth is most important and that this care should be of the type described previously; and, too, that the care of the well baby at birth and regularly thereafter for the first 3 and 4 years of his life is obligatory to insure the promotion of health and the prevention of maladjustments. Well baby care in private practice or clinic thus constitutes a cornerstone in the foundation of good health. Too often the well baby clinic is staffed by physicians and nurses who are inexperienced in the care of children; in fact, they are deliberately appointed to such positions because it is erroneously believed that they can do no harm to well babies and that the duties of the more experienced person should be reserved for the care of sick children because this demands mature judgment. There can be no disagreement with the latter supposition but it is incorrect, shortsighted, and harmful to think that the care of the healthy baby does not require the supervision of persons with good judgment and a vast store of knowledge and experience. The well baby clinic to function as a good instrument of preventive medicine and mental health should be staffed by people with excellent training in pediatrics, who have themselves become mature in their personal development and their professional thinking so that they are eager to seek out and learn about the facts of normal growth and development and are as stimulated by contact with healthy babies and children and their parents as they are by the most dramatic pathology in the sick.

The time for interview and examination in the well baby service must be ample for each physician or his nurse associate to listen in a careful and reasonably unhurried manner to the

biographical history of the baby and his immediate family, to examine the infant, to discuss progress or lack of it with the parent, and to answer his or her numerous questions about infant and parental health, and feelings and attitudes of parent and child, not only in terms of food and eating but of all habits and physiological and psychological needs. Such an interview cannot be carried out in 10 or even 30 minutes. The exact time will vary with each occasion and cannot be blueprinted. Suffice to say that a period of not more than 60 minutes and somewhere between 45 minutes and 1 hour per patient will prove satisfactory in most instances. An objection may immediately be raised by the personnel of the usual well baby clinic that this is too much time, that there are too many patients per physician for each to be given so much consideration; and that so much time is not needed anyway and is wasteful since the "giving of advice about feeding" can be done in a few minutes to any intelligent mother.

Experience has demonstrated that after the first and second visit with a mother and her new baby less time will be required since the mother will have fewer questions to ask because, through the physician's relationship with her and the child and his previous assistance to them, many queries will have been anticipated and many problems prevented. It cannot be too strongly emphasized that the care of an infant in a well baby clinic consists of more than "giving advice about feeding," and that whenever a patient consults a physician there is set up an interpersonal relationship which consists of more than the asking for and giving of advice about anything. This interpersonal relationship has possibilities for psychological growth in mother and infant which may influence greatly the development to maturity of the child.

This paper cannot be concerned with a detailed analysis of physician-patient or nurse-patient relationships, but it can emphasize that the relationship is more than an intellectual association where a teacher in the form of a physician or nurse distributes answers to questions from a pupil in the instance of a mother. Physician, nurse, and parent are persons; each is as different in personality as in profession, and each has different feelings as they come together to discuss still another being, the infant, who is equally distinct and different.

While the giving of information and the discussion of procedures of infant care in detail are important and are the reasons for meeting with the physician, emphasis on content alone is insufficient; in fact, when this is done the real needs may be overlooked because too much information is given at one time and too many details are included, so that the parent leaves the conference in a confused state with the relationship to the physician weakened. The physician and nurse to be really useful must see a human being as an individual in relation to other human beings, and if the peculiarities of early life relationships are appreciated, the physiological processes will be safeguarded against development of psychopathology.

SUMMARY

In summary, the personalizing of clinical medicine in the prenatal and well baby clinics gives emphasis to the emotional and intellectual needs as well as to the physical requirements of parent and child and exemplifies the ideal in preventive medicine, not in narrow terms of nutrition but in the broad aspects of human growth and well-being.

Accident Prevention— An Essential Public Health Service

Program Developed by Subcommittee on Accident Prevention,*
Committee on Administrative Practice,
American Public Health Association

AS a cause of death, accidents rank fifth in the United States, exceeded only by heart disease, cancer, cerebral hemorrhage, and nephritis. In age groups 2 to 28, accidents rank first. In 1944, according to the National Safety Council, they were responsible for 94,000 fatalities and an estimated 10 million disabling injuries.

Recognizing the vital part which organized accident prevention activities can play in reducing mortality and morbidity, the Committee on Administrative Practice has created a Subcommittee on Accident Prevention. Since 1942 this group has explored the field of accident prevention, giving special attention to the part which public health agencies are now playing in this field.

The subcommittee has found that rather well developed organized activities leading to the prevention of industrial and traffic accidents have been undertaken by official and nonofficial agencies. It is noted, however, that insufficent organized attention has been given to the prevention of home accidents. These accidents alone represent the ninth cause of death in this country, and were responsible in 1944 for 30,500 fatalities, one-third of all accidental deaths; and an estimated 5 million disabling injuries, about half of all such injuries.

The subcommittee believes that the prevention of home accidents represents one of the major untilled fields of public health. It further feels that public health agencies, particularly official health departments, are in a very advantageous position and are probably best equipped among public agencies to undertake active leadership and to develop organized approaches to the prevention of home accidents. These agencies have well developed educational techniques and existing home and community contacts through a professional staff, which make them peculiarly suitable for activities in this field. In all probability deaths from accidents lend themselves to control more fully than do any of the other leading causes of death.

A study of the manner in which accident prevention engages the attention of state health organizations has been made by the subcommittee and published by the American Public Health Association.* Five state health organizations, namely New York, Minnesota, New Jersey, Illinois, and Kan-

* Subcommittee on Accident Prevention, Donald B. Armstrong, M.D., Chairman, W. W. Bauer, M.D., D. A. Dukelow, M.D., Thomas Fansler, F. Ruth Kahl, R.N., Edward S. Rogers, M.D., Ernest L. Stebbins, M.D., Paul F. Stricker, Elizabeth S. Taylor, R.N.

* Accident Prevention Engages the Attention of State Organizations. Reprinted from "The Spotlight," January, 1944. Reprints available.

sas, have active programs. About 300 state, county, and local health departments have been asked by the committee to outline their past and current activities in accident prevention. From a study of data assembled, the following conclusions have been reached.

1. Health departments on the whole are now doing very little as regards actual or contemplated studies in the home accident field.
2. Some casual educational work is being undertaken, generally in coöperation with other agencies and frequently through nursing staffs.
3. There is considerable awareness of the importance of the field and the logic of health department participation in it. There is also evidence of a desire for suggestions and information which health departments can utilize in connection with integrating safety with health educational activities.

Based upon its study, therefore, the subcommittee presents a brief review of the kind of activities which should be undertaken by official health agencies to bring about an effective working plan aimed toward the prevention of home accidents. This review refers primarily to activities on the local level. It is the opinion of the subcommittee, however, that county and state health departments are in a unique position not only to stimulate home safety progress by local health departments, but to undertake county and state-wide activities with the same basic objectives in view.

INTEGRATION

Home safety activities can be developed most effectively by health departments if integrated with existing educational and other activities of the department. In many instances, such integration can be effected in the routine of the following divisions:

1. Vital Statistics
2. Public Health Nursing
3. Sanitary Inspection
4. Health Education
5. Maternal and Child Health
6. Food and Drug Control (house poisoning)
7. Industrial Hygiene Bureau (employee "off-the-job" safety program)
8. Housing Bureau
9. Bureau which licenses boarding homes for children, and other facilities

FACTUAL DATA

There is need of more epidemiological study of the home accident problem, as a basis for the development of effective preventive approaches. Such studies, particularly when conducted in a specific locality, should indicate the importance of accidents as a cause of mortality and morbidity and should provide pertinent data for use in the preventive program of the area.

Considerable information is usually available through vital statistics channels. It will, however, require additional analysis and interpretation. In general, there is very little, if any, existing procedure for the reporting and study of nonfatal home accidents. An exploration into the field of hospital morbidity records and a consideration of the need of spot surveys and community-wide studies will be necessary in order to obtain a comprehensive idea of the morbidity aspects of home accidents. It seems logical that health departments, in collaboration with safety agencies, will need to develop standard forms for the reporting of fatal and nonfatal home accidents, comparable to those utilized for the reporting of traffic and industrial accidents.

PERSONNEL TRAINING

In order that the health department personnel, including nurses, inspectors, health educators, and others who come in close contact with the public, may be fully conversant with the cause of home accidents and proper preventive measures, a special home safety in-service course may be desirable. In other instances, home safety may be integrated effectively with in-service health train-

ing courses. A manual based on a recent Home Safety In-Service Course conducted by the New York City Department of Health, is being prepared and will be published and distributed by the National Safety Council.

DIRECT CONTACT THROUGH HEALTH DEPARTMENT PERSONNEL

A systematic plan of education through personal contacts by nurses, inspectors, and others will prove an effective means of stimulating personal interest in home safety. Such a plan may include the health department employee's observations of unsafe conditions and practices and his constructive comment regarding proper preventive measures. It may also include the encouragement of home inspections and the distribution of inspection blanks, booklets, etc. In addition, home visits afford an opportunity for the health department employee to note hazardous conditions beyond the control of the resident and to report such conditions to the proper city departments.

DIRECT CONTACTS THROUGH OTHER AGENCIES

The health department is in a position to encourage local medical societies, visiting nurse associations, social service agencies, and other groups having direct contact with the home to stimulate physicians and other professional personnel to emphasize accident prevention in their home contacts. In many areas the health department may consider it desirable to take the initiative in organizing a planning committee of such groups.

GENERAL PUBLIC EDUCATION

Many health departments will find it advantageous to use accepted measures of general public education in connection with home safety programs. These activities may supplement or be integrated with health educational activities. They will include, for example: the conduct of neighborhood meetings; the development of effective home safety displays in health centers, department store windows, etc.; the showing of films; the general distribution of literature and posters; the preparation of news releases and press items; the use of radio and other measures which can be developed advantageously in the local community. The health department, with appropriate aid from other official and private agencies might set up a well rounded home accident control demonstration in a selected area of the city.

COÖPERATION OF OTHER AGENCIES

In many instances the health department will be in a position to initiate or aid in the development and conduct of community-wide home safety educational programs, with the coöperation of other city authorities such as the schools, police, fire, and building departments and with the coöperation of industrial, business, educational, labor, and other nonofficial agencies interested in the subject.

REGULATIONS AND ENFORCEMENT

In coöperation with architects and the building, fire, and police departments of a city, the health department is in a position to undertake a study of the need for additional regulations and for the more effective enforcement of these regulations with respect to the construction, design, and maintenance of buildings used as residences.

Suggested Home Safety Activities*

For Consideration of Local Health Departments

THE Subcommittee on Accident Prevention of the Committee on Administrative Practice of the American Public Health Association, has submitted a report stressing the importance of home safety as an activity of health departments, and emphasizing the logic and value of including home safety in health educational activities. Based upon this report the committee presents herewith suggestions for consideration in developing an integrated program.

In considering these suggestions it should, of course, be recognized that the degree to which the health officer or health department may conspicuously specialize in accident prevention activities bears a relation to the size of the community and to the diversity of organization in the department. Furthermore, the divisions of the health department mentioned may not exist in all communities or the work may not be divided as indicated. Accordingly, the setup of the department itself may dictate a redistribution of the somewhat arbitrary allocation of activities as suggested.

HEALTH OFFICER

1. Arrange for the collection, analysis, and study of home accident statistics to determine necessary preventive steps in the area.

2. Survey the home safety educational work of the community to determine what organizations are participating and what additional activities are needed.

3. Develop and promote a program for the effective integration of home safety with the activities of existing bureaus or agencies of the department.

4. Take the initiative in developing coöperative relationships with other governmental departments such as welfare, housing, sanitation, fire, building inspection, etc.; and in promoting and sponsoring organized community-wide home safety activities, through voluntary agencies, medical societies, physicians, nurses, etc.

5. Consider the appointment, on full- or part-time as conditions warrant, of a safety adviser to coördinate the safety activities of the department, to act as a consultant to the commissioner and bureau heads, and to represent the department in community home safety activities.

6. Through news releases and other publicity, present information regarding home accidents and their prevention, and regarding home safety activities of the department and community.

BUREAU OF VITAL STATISTICS

1. Obtain additional data, supplementing the death certificate, for home accidental fatalities. A suggested form for use in collecting this information through reporting officers, nurses, and others, has been developed by the National Safety Council.

2. Prepare monthly and annual tabulations and analyses of home accident fatalities, and follow through with their evaluation. The routine filing of reports without evaluation and interpretation accomplishes little. A suggested form for this purpose has also been prepared by the National Safety Council.

3. Develop methods of obtaining and analyzing comparable data concerning non-fatal home accidents. Information regarding the occurrence of such accidents can, in most instances, be obtained from hospitals and police departments. These data, however, are usually insufficient for study purposes and in some communities supplemental information has been obtained through health department employees or volunteer groups. The A.P.H.A. or the National Safety Council will be glad to assist the local health department in developing a plan for obtaining this information.

NURSING BUREAU

1. Arrange for an in-service training

* Prepared by Subcommittee on Accident Prevention of the Committee on Administrative Practice, American Public Health Association.

course * in home safety for the present personnel of the nursing bureau and provide similar training for new employees. Invite other public health nurses in the area to attend these courses.

2. Instruct members of the nursing bureau to submit detailed reports, on appropriate forms, of all home accidents coming to their attention.

3. Encourage nurses to integrate home safety education with health education when visiting homes.

4. Instruct nurses to report to proper authorities unsafe conditions noted in home premises which cannot be corrected by tenants.

SANITARY INSPECTION BUREAU

1. Arrange in-service training course * in home safety for the members of this bureau.

2. Instruct inspectors to submit reports, on appropriate forms, of all home accidents coming to their attention.

3. Arrange for the reporting of unsafe conditions to proper authorities.

4. Make a study, possibly in conjunction with housing and health surveys, of unsafe conditions in home premises to determine need of legislative action.

HEALTH EDUCATION BUREAU

1. Integrate home safety education with health education wherever practical in the regular activities of the bureau, including the distribution of booklets, posters, etc.

2. Study the possibilities of additional home safety educational activities.

MATERNAL AND CHILD HEALTH BUREAU

1. Make a special study of accident hazards relative to the care of infants and younger children.

2. Through clinics and other means teach mothers the safe methods of handling infants and younger children.

FOOD AND DRUG CONTROL UNIT

1. Study the use, storage, and labeling of poisonous materials in homes.

2. Consider the need of additional regulations regarding their use and storage.

3. Develop educational material on the subject.

INDUSTRIAL HYGIENE BUREAU

1. Encourage employers of labor to ascertain how much lost working time is due to non-occupational accidents, and to undertake off-the-job safety programs among their employees, including specifically the subject of home safety.

2. Develop home safety material for use by employers or assist employers in obtaining such material.

HOUSING BUREAU

1. Coöperate with architects, builders, and others in studying accident as well as health hazards in the various types of dwellings in the community.

2. Suggest necessary legislative action relative to safety in dwellings.

BUREAU WHICH LICENSES BOARDING HOUSES FOR CHILDREN AND OTHER FACILITIES

1. Coöperate with the Housing Bureau and other agencies in studying accident hazards in boarding houses, day nurseries, etc.

2. Inspect boarding houses before issuing licenses, requiring necessary construction or repairs to eliminate hazards.

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* A manual for such a course is being developed for publication by the National Safety Council.

Nursing Records in Industry*

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OF late attention has been focused on the *kinds* of records which should be kept by the industrial nurse. Much less has been said about *criteria for the selection* of *record systems* and about ways in which the nurses' records may be *used* effectively.

Unless a record fits the job to be done, and unless every item in it is used for some purpose, much time, effort, and money are wasted. What can be more wasteful than workers waiting in line for care while the nurse records treatment given to the preceding worker, especially if the record will be used little, if at all, for improving the plant medical service. Yet I have seen this happen. A more common waste in the small industrial dispensaries I know is the time the nurse spends recording, after her hours on duty should be over, because she could not get it done during her busy day.

There are still many small industrial plants, at least, where the persons planning the record system have apparently thought only of meeting contingencies that might arise under the compensation act. Such inadequate recording is as wasteful as too much recording poorly used, for cumulative individual health records are the cornerstone of health counseling. If a registered graduate nurse lacks the knowledge and tools for health counseling, much of her capacity for service better than that which a first aid worker could give is wasted.

A committee of industrial nurses sponsored by the American Public Health Association[1] studied the duties of nurses in industry in 1943. They included records in their study and recommended that: "(1) The medical records be kept strictly confidential except as interpretations of them are needed by management; (2) all medical records be kept in the medical department and available for use each time a worker presents himself for care; (3) when the physical examinations of workers are made outside the plant, the records or copies thereof be made available to the nurse; (4) clerical assistance be provided in order that the nurse's time may be conserved and records adequate. Further, the following types of records and reports are needed: (1) daily record or log; (2) individual record, including the medical examination, clinical visits, and the correction of remediable conditions; (3) disability absentee records; (4) compensation records and reports; and (5) monthly and annual reports to management."

Industrial nurses need very much to have more group study of industrial health records which will lead toward some standardization. At present we are keeping records in so many different ways that it is difficult to compare the health situation and the work done in one plant with that in other plants. It is difficult to relate the vital statistics of industry to the vital sta-

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

tistics of the community and the country as a whole.

We need a representative group to study and set up criteria which can be used in selecting record systems for plants of various sizes with various types of health problems.

Lacking these standards and criteria, the nurses and statistician working with me in small industrial plants having contracts with the Visiting Nurse Service of New York, asked ourselves the following questions in setting up our own record system:

1. What are the *legal requirements* that must be met in our state?
2. For what *purposes* other than legal will the records be used—by nurse, doctor, management, community, and nation?
3. What *methods* will be used to carry out these purposes?
4. How can we keep our record system simple enough for a varied group of nurses to understand and to use without confusion?
5. What simple devices may be used to save time, improve accuracy, and increase the uses to which the record may be put?
6. How much can we expect the plant to spend for record forms, filing cabinets, and other equipment?
7. How much clerical help will the nurse have?

I will discuss and illustrate each of these questions briefly.

1. *What are the legal requirements that must be met?* Our physicians and liability insurance company representatives have been most helpful with this problem. The one point we have had to emphasize to each of our nurses going into an industrial plant is the use of the word "alleges" or "states" when she records the worker's own statement about how his accident occurred. As our doctors pointed out to us, omitting such a word implies that the nurse herself saw the accident and that the record is her own description of what she saw. As a rule the information she records is what the patient tells her.

Any of us working in industry knows that a good record of an industrial injury protects the worker by making sure that evidence of his injury on the job will be available. It also protects the employer against unjust claims. Too, a good description of the accident may assist the physician in deciding what treatment is necessary.

We have been somewhat concerned about the intimate personal data which creeps into individual records in a program of health counseling, fearing that workers might be disturbed if it were revealed in court. To overcome this we try to keep all social data regarding a patient on a separate blue sheet which may be removed from a record if necessary. The disadvantages of this procedure are obvious.

2. *For what purposes other than legal will the records be used?* This seems to me the most important question on the list and the one having most ramifications. It should be answered before any item besides those required by law is included in a record system. Some of the well known uses of records are:

a. To improve the guidance—the health counseling—which is given to the individual worker regarding his health or his illness. This I have already mentioned. A single complaint may be unimportant but as Dr. Fulton [2] so clearly demonstrates, periodic or repeated complaints of the same nature may mean a good deal. The pattern of illnesses or accidents for any individual—often called his health profile—is more significant, except perhaps in emergencies, than his state of well-being or ill-being at any given moment.

b. A second well known use for the nurses' records is in the compilation and analysis of the facts they contain, in order to study the health situation in the plant as a whole. This may then be compared to the situation in other plants having similar conditions. A good record system is as important for health guidance of the whole plant as for the individual worker.

c. Another purpose for which industrial records are commonly used is to interpret to management the situation in the plant and the needs which are not being met so that improvements in the health program may be

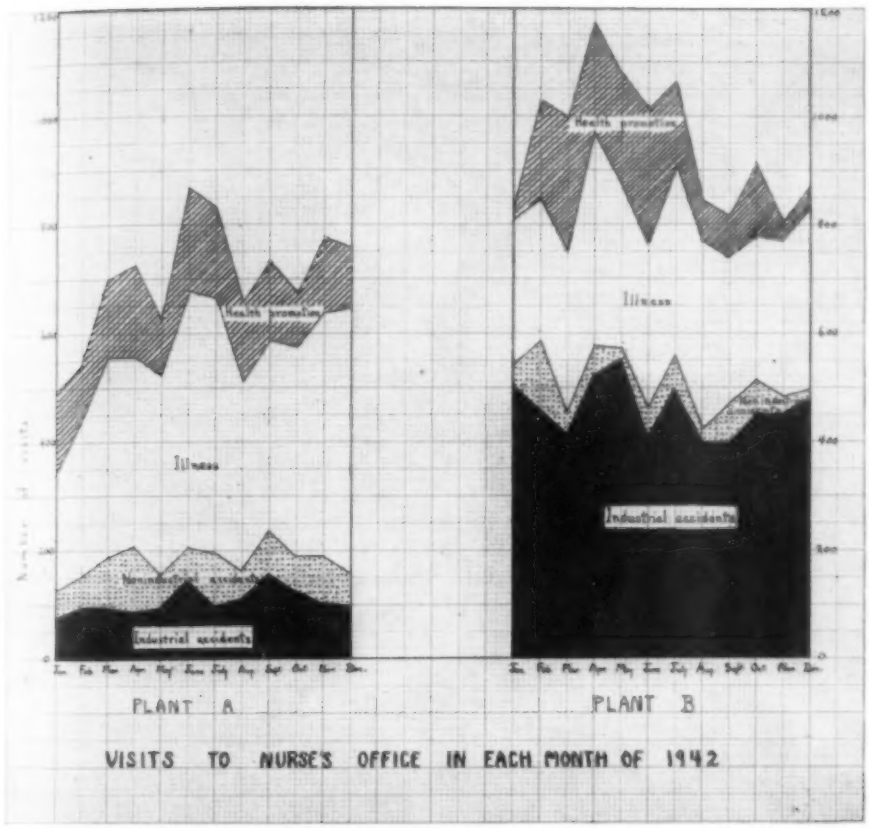

CHART I

made. There has been a good deal of discussion and writing about this important use of records. Dr. Fulton [2] who has contributed many ideas to this field, also, says that reports to management and the statistics included must be written in language which business understands. This is a good point but is it not even more necessary to use words and statistics that any individual can understand? It is good to speak the language of business to business, but if we are to gain community support too, should we not use the common language which any average adult can understand?

We used these simple graphs (Chart I) to demonstrate to one of our plant executives the need of more nursing service. It proved to be very effective. We used the same graph to show the content of our industrial nursing service to members of our board. The monthly visits to the dispensary in plant A approximate the number a nurse can carry alone and do a good job according to Dr. Fulton's [2] and our own studies. The load carried by the nurse in plant B was consistently higher through the whole year. She was so busy she had no time to work with the safety department on the very obvious industrial accident problem which exists in this plant.

d. Another use of records which is less frequently mentioned but which has unlimited possibilities is to relate the vital statistics of industry to the vital statistics of the community and nation.

Dr. Fulton's [2] "Medical Severity Index" appears to be one unusually interesting way to do this. He computes this index by relating the number of employees sick enough to be

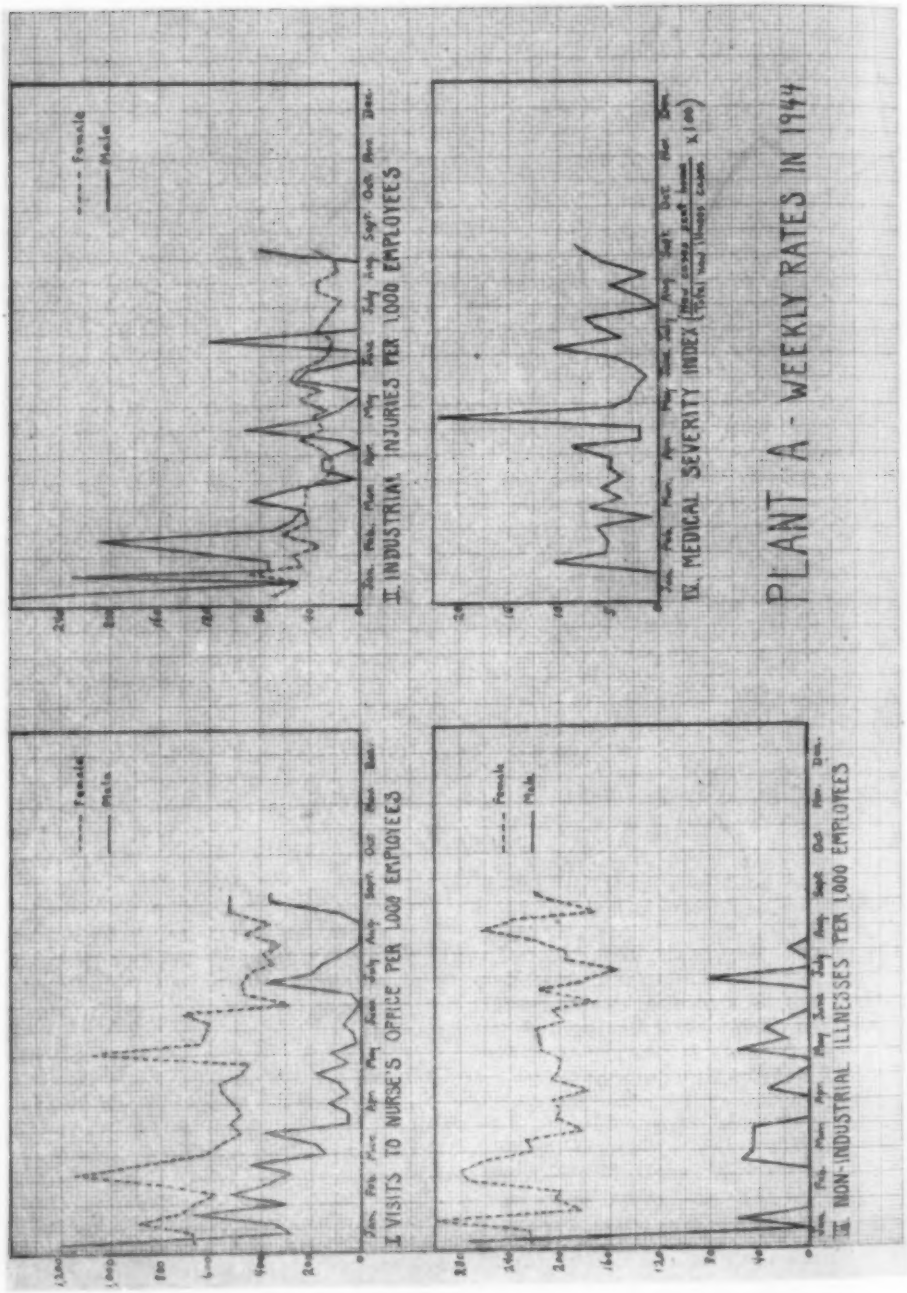
PLANT A - WEEKLY RATES IN 1944
I. VISITS TO NURSE'S OFFICE PER 1,000 EMPLOYEES
II. INDUSTRIAL INJURIES PER 1,000 EMPLOYEES
III. NON-INDUSTRIAL ILLNESSES PER 1,000 EMPLOYEES
IV. MEDICAL SEVERITY INDEX
Female
Male

CHART II

sent home to the total new cases of illness seen in the dispensary. Some graphs showing our adaptation of this index are appended.

3. The third question which we asked ourselves in formulating our record system was: *What methods will be used to carry out the various purposes of our records?* Safety workers have developed interesting methods for studying accidents. Examples of such methods are the frequency and severity rates or indices based on man-hours worked. Other methods are the analyses of accidents by type, anatomical location, department and time of occurrence.

Dr. Gafafer's [3] use of the disability, severity and frequency rates per 1,000 employees in studying absenteeism is another method of using industrial records. We have combined both Dr. Gafafer's ideas and Dr. Fulton's in working out some simple methods for studying the following conditions in our plants:

1. The total visits to the dispensary
2. The number of industrial accidents
3. The amount of non-industrial illness
4. The severity rate or index for non-industrial illness

The charts will illustrate these rates:

Plant A is a radium dial-painting plant of about 600 workers, mostly young women. The rate of visits to the dispensary for women in this plant was higher than for any other plant we studied but it still follows the general pattern found in our other plants.

Weekly rates for men fluctuated widely because the number of male employees is so small. We questioned including the rates for males in this plant in the graphs. I am showing them to you because they follow the general pattern for male rates found in our other plants also. The rate for visits to the dispensary for women is consistently higher than that for men.

Graph 2 on Chart II illustrates the tendency for men to have a higher rate for industrial injuries than women. Very minor as well as lost-time accidents are included in this rate. In this plant the men are doing the heavier work with the most hazards.

Graph 3 shows how much higher is the rate among women for non-industrial illnesses. This includes all of the minor illnesses which involve no lost time.

It is too soon for us to say of what significance the medical severity index in graph 4 will be. Dr. Fulton has used it to predict absenteeism in his plant with 80 per cent accuracy over a number of years. He finds it closely parallels the general state of illness in the community but the peaks appear sooner. This he thinks is because sick people visit the dispensary earlier than they do the private physicians and clinics.

Chart 3 shows these same rates for a small steel plant. Women and men employees are about equal. Many of the women are doing men's work. Yet the general patterns in the graphs for the other plant hold true.

4. The fourth question which we asked ourselves was: *How can we keep our records simple enough for a varied group of nurses to use and understand?* This is one of our most difficult problems as the health work done in different plants varies. This variation seems necessary if the needs of the particular plant and the desires of plant management, workers, and physicians are to be met. Repeatedly, we have met as a group to simplify terminology and to discard all items in the reports that are not proving useful. Last winter we added a detailed manual of instructions for the use of each record form which even the more experienced nurses have found helpful.

5. Our fifth question relates to the *simple devices which we might use to save time, improve accuracy, and increase the uses to which the record*

CHART II

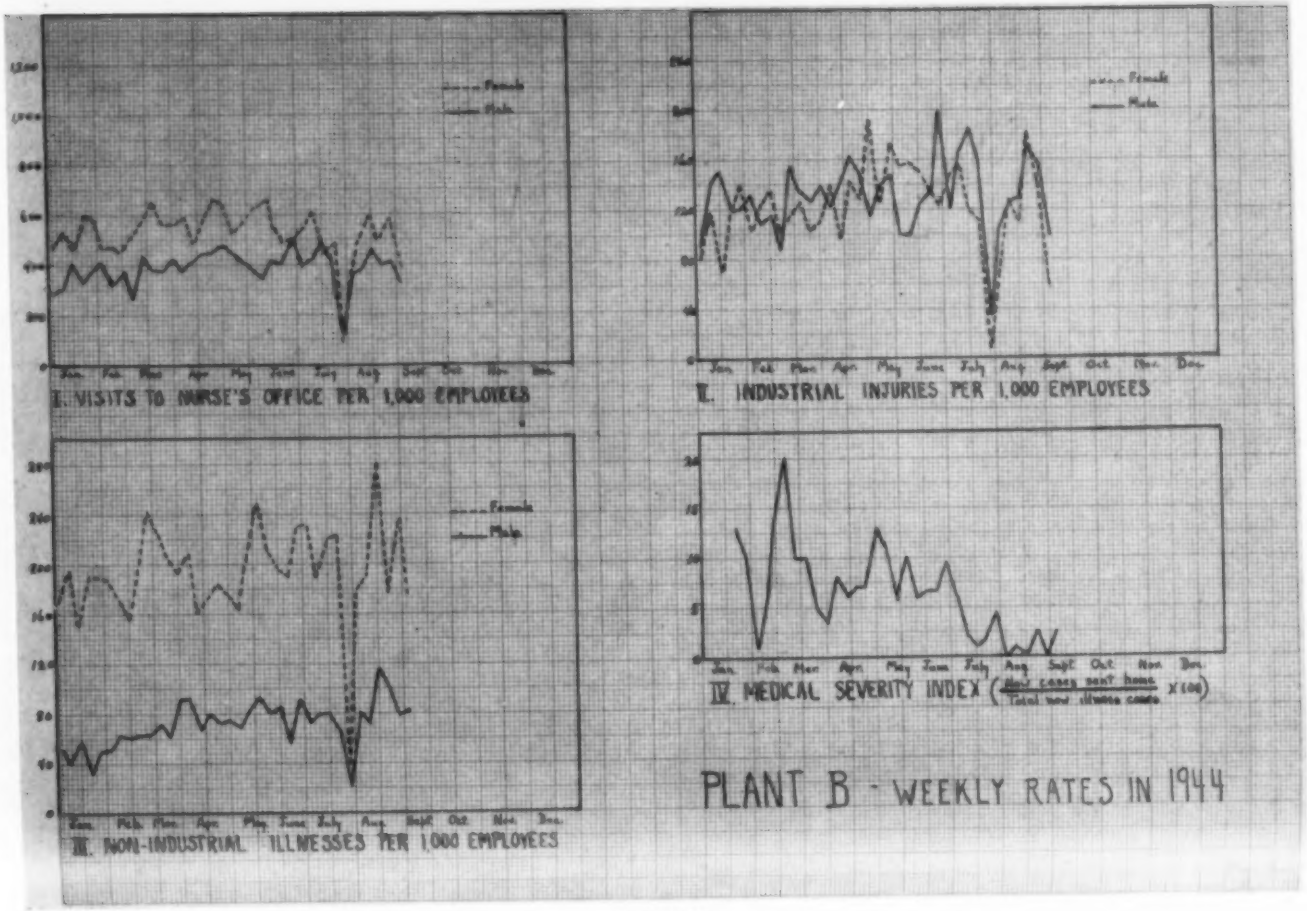
Female
Male
I. VISITS TO NURSE'S OFFICE PER 1,000 EMPLOYEES
II. INDUSTRIAL INJURIES PER 1,000 EMPLOYEES
III. NON-INDUSTRIAL ILLNESSES PER 1,000 EMPLOYEES
IV. MEDICAL SEVERITY INDEX
PLANT B - WEEKLY RATES IN 1944

CHART III

might be put. One of the first demands of our group was for a set of more or less standardized abbreviations which might be used in recording. We agreed upon this list and it has proved a real time saver.

In the plants where small finger injuries are frequent we use a hand stamp which saves a great deal of time. We find eye stamps unnecessary, as all imbedded foreign bodies in eyes are immediately sent to ophthalmologists outside the plants.

We have talked of coding our standing orders, especially those which are very frequently used, such as minor first aid or advice about rest or preventing infections. One of our nurses is trying such a code now. I do not know whether it will prove practical or not.

Our sixth and seventh questions—*How much clerical help will the nurse have?* and *What is the plant willing to spend for forms and equipment?* were rather simply answered for us. In very small plants clerical help for the nurse was scarce before the war—it is practically nonexistent now. So we must plan our records to take as little of the nurse's time as possible. Most of the statistical and clerical work necessary for interpretation of the records is done at our central office.

As all of our plants are small and even $10 for forms and equipment looms big, we adopted mimeographed forms wherever the number needed was too small to be printed economically. We use the regular letter-size manila folders and locked filing cabinets which most plants already have.

The questions discussed and many others need study by a representative group from all over the country which will make practical recommendations.

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Destruction of Water-borne Cysts of Entamoeba Histolytica by Synthetic Detergents*†

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OF the pathogenic organisms whose transmission by water has been established, the cysts of *Entamoeba histolytica* are apparently the most resistant to destruction by the chemical disinfectants that are in general use today. The reaction of these cells to the newer group of synthetic detergents and their possible use in water disinfection are, therefore, of interest.

The synthetic detergents are organic compounds of relatively large molecular size. Although they exhibit hydrophobic properties, they are soluble in water. Since the cohesive force between these substances and water is greater than their intermolecular cohesive force, they lower the surface tension of the water and tend to concentrate at liquid-liquid, liquid-solid, and liquid-gas interfaces. Hence they are also known as surface-active agents, surface tension depressants, and wetting agents. The synthetic detergents are classified as neutral, cationic, or anionic detergents, depending upon whether they are undissociated, dissociated with cationic hydrophobic radicles, or dissociated with anionic hydrophobic radicles, respectively. Hexylresorcinol is an example of a neutral detergent; the alkyl quaternary ammonium or pyridinium compounds are representatives of the cationic detergents; and the sodium salts of the sulfated or sulfonated fatty acids or alcohols are examples of anionic detergents.

EXPERIMENTAL METHODS

The methods of producing cysts of *E. histolytica*, preparing cyst-polluted water, collecting cysts from treated water, and determining the viability of the recovered cysts are described in previous communications from our laboratory.[1, 2] The detergents studied are listed in the following schedule: *

In testing the cysticidal efficiency of these substances, dosages were based, for fluid preparations, on the percentage of active ingredient indicated by the manufacturer and, for solid preparations, on the weight of the powder without reference to its moisture con-

* Presented before the Engineering Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

† Work done under contract with the Office of Scientific Research and Development.

* Most of these substances were secured through the courtesy of their manufacturers; some of the detergents were obtained through the kindness of Dr. R. J. Dubos of the Harvard Medical School; others were purchased in the open market.

Commercial Name	*Chemical Structure*	*Manufacturer*
Cationic		
1. Fixanol	Cetyl pyridinium bromide	E. I. Dupont de Nemours & Company
2. Sapamine Kw		Ciba Company
3. Nopco-QCL	Lauryl dimethyl benzyl ammonium chloride	National Oil Products Company
4. Ceepryn	Cetyl pyridinium chloride	The Wm. S. Merrell Company
5. Zephiran	Alkyl (C_8 to C_{18}) dimethyl benzyl ammonium chloride	Winthrop Chemical Company
6. Triton-K60	Cetyl dimethyl benzyl ammonium chloride	Rohm & Haas Company
7. Roccal	Alkyl dimethyl benzyl ammonium chloride	Winthrop Chemical Company
8. In-4276	Decamethylene bis-(decyldimethyl ammonium bromide)	E. I. Dupont de Nemours & Company
9. Hyamine-1622	Diisobutylphenoxyethoxyethyl dimethyl benzyl ammonium chloride	Rohm & Haas Company
10. Emulsol-660B	Lauryl pyridinium iodide	Emulsol Corporation
Neutral		
11. Hexylresorcinol	1-*n*-Hexyl-2,4-dihydroxybenzene	Sharp & Dohme
Anionic		
12. Aerosol-OT	Dioctyl ester of sodium sulfo-succinic acid	American Cyanamid & Chemical Corporation
13. Tergitol-4	Sodium-7-ethyl-2-methylun-decanyl-(4) sulfate	Carbide & Carbon Chemical Corporation
14. Tergitol-4T	Triethanolamine derivative of 7-ethyl-2-methyl-undecanol-4	Carbide & Carbon Chemical Corporation

tent. Fixanol was available to us only as a crude paste of undetermined strength, and the amounts of active ingredient actually applied are probably smaller than those reported in this paper.

A quart of water was treated in each test. Uniform distribution of the detergent was secured by placing the treated water in a shaking machine. The pH of the treated water was controlled with one-fifth molar phosphate buffer and citric or acetic acid.

At first, cysts that had been exposed to disinfection were freed of detergents by repeated centrifuging and washing with distilled water. Later, the anionic detergent Aerosol-OT, which itself is not cysticidal in required amounts, was used to neutralize the cysticidal activity of the cationic detergents.

The tests selected were designed to give information on the cysticidal efficiency of detergents as influenced by the nature and composition of the detergent, the density of the cysts, the pH of the treated water, and the presence of suspended organic solids, proteins, and phospholipids.

EXPERIMENTAL RESULTS

The cysticidal dosages observed for fourteen synthetic detergents are recorded in Table 1. The results show the superiority of certain of the cationic detergents over the neutral and anionic substances that were submitted to test. At the same time the table suggests that the effectiveness of any one compound is widely variable. The most successful cationic detergents tested were effective in one-third to one-fifth

TABLE 1

Cysticidal Dosages of Synthetic Detergents in Tap Water Containing 30 Cysts per ml. at 23 to 25° C.

Detergent	Dosage (p.p.m.) for Stated Contact Periods (min.)			
	10	30	60	120
Cationic				
1. Fixanol	15–30	10–15	5–10	5–10
2. Sapamine	20–30	5–20	5–15	5–10
3. Nopco-QCL	20–30	10–20	10	..
4. Ceepryn	15–35	10–35	5–20	10–20
5. Zephiran	..	30	..	..
6. Triton-K60	..	30	..	..
7. Roccal	>30	>30	>30	>30
8. In-4276	>30	>30	>30	>30
9. Hyamine-1622	>30	>30	>30	>30
10. Emulsol-660B	>75	>60	>45	..
Neutral				
11. Hexylresorcinol	75	30–50	30–50	30–50
Anionic				
12. Aerosol-OT	>1,000	>1,000	>1,000	>1,000
13. Tergitol-4	>1,000	>1,000	>1,000	>1,000
14. Tergitol-4T	>1,000	>1,000	>1,000	>1,000

The final pH of the treated waters ranged between 6.0 and 7.0 except for Hexylresorcinol for which it ranged between 7.0 and 8.0.

the concentration required for the neutral detergent, Hexylresorcinol, while the anionic detergents tested were not cysticidal in the concentrations examined. The relative efficiency of the cationic detergents tested can be gaged from a comparison with similarly effective concentrations of gaseous chlorine.[1] These lie approximately at 3 p.p.m., 2 p.p.m., and 1 p.p.m. for contact periods of 15 min., 30 min., and 120 min. respectively.[1] Required concentrations of the detergents, therefore, are about ten times as great. In comparison with halazone, however, they are only about twice as great on a weight basis. Within the limitations of the tests, it appears that the cysticidal dosages of the best cationic detergents were reduced by about 30 per cent each time the length of the contact period was doubled. The response of Hexylresorcinol was less marked.

The increase of dosage requirements with cyst density is recorded in Table 2 for the two cationic detergents Fixanol and Sapamine and for the neutral detergent Hexylresorcinol.

It appears from this table that the required increase in dosage is of the

TABLE 2

Cysticidal Dosages of Three Detergents in Tap Water Containing Increasing Numbers of Cysts at about 25° C.

Detergent	No. of Cysts per ml. of Water	Dosage (p.p.m.) for Stated Contact Periods (min.)			
		15	30	60	120
1. Fixanol	30	15– 30	10– 15	5– 10	5– 10
	200	45– 60	35– 50	20– 30	10– 25
	500	60– 80	50– 70	30– 45	15– 30
2. Sapamine	30	30	5– 20	5– 20	5– 15
	200	45– 65	40– 55	20– 35	10– 30
	500	60– 80	50– 75	25– 45	15– 30
11. Hexylresorcinol	30	50– 75	30– 50	30– 50	30– 50
	200	80–100	60– 80	60– 80	55– 75
	500	95–120	85–100	80–100	80– 95

For pH values see footnote to Table 1.

order of 30 per cent for each doubling of cyst densities in so far as the more active cationic detergents are concerned. This is the same as for gaseous chlorine.[1] For the more sluggish Hexylresorcinol this increase shrinks below 20 per cent.

Hydrogen-ion concentration, as shown in Table 3, exerted but little, if any, significant effect in tests conducted on Fixanol, Sapamine, Hexylresorcinol, and Tergitol-4T. The somewhat greater efficiency of Fixanol at the neutral point was not shared by Sapamine.

TABLE 3

Cysticidal Dosages of Four Detergents at Varying pH Values in Tap Water Containing 30 Cysts per ml. at 23 to 25° C.

Detergent	*Final pH of Treated Water*	*Dosage (p.p.m.) for Stated Contact Periods (min.)*		
		10	*30*	*60*
1. Fixanol	8.6–9.0	10–25	5–15	5–10
	6.8–7.1	10–15	5–10	5–10
	4.0–4.2	25	20–25	10
2. Sapamine	8.8–9.0	20–30	5–20	..
	6.8–7.0	20–30	5–20	..
	4.0–4.2	20–30	5–20	..
11. Hexylresorcinol	8.8–9.1	..	45	..
	7.0–7.6	..	40–50	..
	3.0–3.5	..	45	..
14. Tergitol-4T	8.6–9.0	>1,000	>1,000	>1,000
	6.8–7.1	>1,000	>1,000	>1,000
	4.0–4.2	>1,000	>1,000	>1,000
	3.5–3.6	..	>1,000	..

The effect of three types of foreign substances in water on the disinfecting power of Fixanol is recorded in Table 4.

dosage of Fixanol was not changed significantly even by 200 p.p.m. of this foreign substance. This is an encouraging fact, because chlorine and its compounds are greatly reduced in efficiency by the chlorine demand exerted by organic matter. Egg albumen and lecithin * were added in certain tests in order to measure the effect of proteins and phospholipids on detergents and with a view to their shedding light on the mechanism of cyst destruction, a matter not discussed in this paper. One of these groups of compounds had been reported[3] as being acted upon by the detergents. Table 4 supports these observations, since the increased dosages of Fixanol

TABLE 4

Cysticidal Dosages of Fixanol in Tap Water Containing 30 Cysts per ml. and Varying Amounts of Agar Agar, Egg Albumen, and Soya Bean Lecithin

Substance	*Concentration (p.p.m.)*	*Dosage (p.p.m.) for Stated Contact Periods (min.)*		
		10	*30*	*60*
None	0	15–30	10–15	5–10
Agar agar	50	25–50	25–50	..
	200	25–50	25–50	..
Egg albumen	50	35–50	35–45	35–45
	200	65–80	60–70	50–65
Lecithin	50	35–50	35–50	35–50
	200	70–90	60–80	60–80

None of the substances chosen is normally present in natural waters. Finely ground agar agar was selected to represent suspended organic matter. As shown in Table 4, the cysticidal required to destroy the cysts, though not large, are significantly different

* The soya bean lecithin was kindly supplied by Dr. H. C. Marks of the Wallace & Tiernan Company.

from the amounts that were effective in the absence of these foreign substances.

SUMMARY AND CONCLUSIONS

Of the synthetic detergents studied, at least four of the cationic substances were found to be efficient cysticides, the single neutral detergent was somewhat less effective, and the three anionic detergents showed little promise. For the disinfection of drinking water, the cysticidal dosage of the best substances tested was about 30 p.p.m. for contact periods of 10 min., and the required dosage was decreased to about 10 p.p.m. as the contact period was lengthened to two hours. Detergent requirements became greater as the density of the cysts to be killed was increased. Hydrogen-ion concentration appeared to have little influence on the cysticidal activity of most of the detergents examined, and the presence of suspended organic matter, too, was of low significance.

The detergent and disinfecting properties possessed by these newcomers to the field of sanitation suggest the exploration of their possible usefulness for a number of purposes other than water disinfection, among them: (1) the sanitation of eating utensils; (2) the safeguarding of shellfish; (3) the cleansing and disinfection of contaminated vegetables and fruits that are to be consumed raw; (4) the cleansing and disinfection of water mains; (5) the cleansing of water filters; and (6) the control of *Psychoda* in trickling filters.

Findings in favor of the synthetic detergents, therefore, are many. Water containing one of these substances in the smallest effective doses here recorded as cysticidal, on the other hand, has a tendency to foam when it is shaken. The resulting suggestive appearance and general sliminess of the water elicit unsatisfactory psychological responses. More important still is our lack of information on the physiological effects that the synthetic detergents may exert upon human beings. Until these matters are fully explored, use of the synthetic detergents for the disinfection of drinking water must necessarily remain in the experimental stage.

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Value of Typing Meningococci*†

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THE present war has brought sudden changes to most laboratories. An increase in certain kinds of routine, a sharp labor shortage, and a curtailment of supplies and materials have made reorganization of work and reëvaluation of methods necessary in most places. There has been no room in the high pressure program of today for procedures of doubtful value. Should the typing of meningococci be included?

Meningococci have been typed for 35 years. First in 1909, Dopter [1] found serological differences among the strains studied by him, and he separated them into the meningococcus and the parameningococcus. Martha Wollstein [2] in this country soon confirmed his observations.

There are many laboratories that began typing meningococci at that time and have been typing them ever since, adopting the newer classifications as they have been developed and contributing materially to the increasing knowledge of these microörganisms. Such laboratories, knowing what has been gained, will, no doubt, continue to type meningococci.

There are many other laboratories that have never typed meningococci. In these days of crowded programs such laboratories will not take on new procedures unless they are convinced that the need for them is urgent.

The year 1943 saw the highest incidence of meningococcus infections ever known: 17,974 reported cases as compared with the next highest incidence of 10,551 in 1929, and 5,749 in 1918 during World War I. This makes a ratio of approximately 18 to 10 to 5 for those years. The number reported for the first six months of 1944 was 11,662, which is a higher figure than for the corresponding period of 1943.

Thus it seems that this is a very appropriate time to consider the question as to how much time and study should be given to the meningococcus cultures that come into the routine laboratory, when they should be referred to research laboratories, and whether or not there are times when it is unnecessary to do anything at all with them.

Many small, over-busy, scantily equipped laboratories never make cultures from cases of meningitis. A Gram-stained smear from spinal fluid may constitute the only evidence for meningococcus infection. In the greater number of localities cultures are made and the organisms identified as meningococci by fermentation reactions and agglutination with polyvalent serum. In most large and well equipped laboratories the serological group of the meningococcus is determined. How far is it important to go? In order to answer this question satisfactorily it will be necessary to ask others: What has been gained by typing meningococci in the past? What does typing do for us now? How useful can it be in the future?

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† From Biologics Control Laboratory, National Institute of Health.

Nearly all of our knowledge of meningococci has been gained through typing. Beginning 35 years ago with Dopter's [1] recognition of what he termed the "parameningococcus" as distinct from the "meningococcus," on through World War I, with the A, B, C, D [3] classification of the French and the I, II, III, and IV types of Gordon and Murray,[4] as well as the I and II grouping of many other British workers,[5–11] thousands of strains of meningococci have been typed. More than 2,000 have been done in our own laboratory.

First let us examine the epidemiological knowledge gained from such routine studies. We have found that there are two main groups of meningococci which have a different significance: Group I seems to be responsible for epidemics [12, 13]; sporadic cases are apt to be due to Group II. There is apparently a fairly constant incidence of sporadic cases due to Group II, and at intervals of approximately 8–12 years [14] epidemic waves due to Group I are apt to occur. These epidemic waves are superimposed upon the fairly constant sporadic level. During times of war, incidence of meningococcus infection is especially apt to increase and epidemics may occur off schedule. During recent years it has been possible to foresee periods of unusual incidence by the increase in the relative number of Group I strains sent in for typing, and to recognize that an outbreak was on the wane by an increased proportionate occurrence of Group II strains.

There were nearly twice as many cases of meningococcus infection reported during 1943 as for any other year for which we have records; more than 90 per cent of these were found to be due to Group I strains. Two years ago most of the relatively few strains sent to us were of Group II.

Group I meningococci can be distinguished not only serologically but in other ways also. Serum prepared against Group I does not protect against other groups, just as that prepared against other groups does not protect against Group I. There are chemical differences. Scherp and Rake [15] have isolated and identified a carbohydrate from the capsular substance which seems responsible for the specificity of the group. To a certain extent there are clinical differences since low grade, chronic septicemias, without meningeal involvement, are less frequently due to Group I strains than to those of Group II. Apparently Group II is, on the whole, less invasive than Group I.

A second important outgrowth of typing is the recognition of the relation of the serological group to the carrier state. It has long been recognized that a large number of people habitually harbor meningococci in the nasopharynx. Rake [16] showed that this condition may persist for years. The meningococci from these chronic carriers are usually of Group II, though some of them may be so "rough" and nonspecific as to be untypable. They are, as a rule, avirulent, as tested in mice, and a high incidence of such carriers may be compatible with complete safety to contacts.

Quite a different significance may be attached to the presence of Group I strains. These carriers are thought to be seldom chronic. The strains harbored by them are usually quite specific, encapsulated, and often quite virulent. A few of these carriers may constitute a very real menace. It is of practical importance to recognize the differences among carriers.

Another interesting, as well as valuable, outgrowth of routine typing is the recognition of new groups. Recently a well defined group of strains emerged from among those usually classified as Group II. The first report of these strains was made by Cohen.[17] They are immunologically distinct, are en-

capsulated, and are good antigens. They are as abundant as the usual II's and are found in cases as well as in carriers. When the clinical importance of this group was recognized it became necessary to give it some specific designation. We have called it II *alpha*,[18] tentatively, following the precedent of Dopter [19] who described *alpha*, *beta*, and *gamma* types among his parameningococci—our Group II. These II *alpha* strains are, however, not a type within the Group II, as the terminology may be interpreted by some to signify. They comprise an independent entity, the real position and significance of which have not yet been accurately determined.

So far we have discussed epidemiological findings only. Our epidemiological questions about meningococci are by no means all answered. Are all epidemics due to Group I strains, or is it a coincidence that such has been the case in this country over the last 25 years? There are reports that seasonal waves of Group II infections occur in the Sudan and other parts of Africa. What is the significance of this? Group II is undoubtedly very heterogeneous and a thorough study of it from a serological standpoint is badly needed. Subgroups, or types of special significance within the groups may be yet unrecognized. Group IV has been encountered only a few times since 1929 when it was very conspicuous. Its clinical and epidemiological significance, as well as its serological relationships are not well understood. There may be many facts about Group I not yet recognized. Laboratories that have always typed meningococci will continue to do so for these reasons as well as for others.

Laboratories which have not been accustomed to typing meningococci routinely, especially small ones with crowded programs and reduced personnel, may feel that this is not the time to take on such procedures as part of their routine, for the epidemiological reasons outlined above. Under present-day conditions they would think it desirable to type the relatively few strains coming to them only if they felt that such typing had a definite bearing upon the treatment of those individual cases.

For many years all cases of meningitis were treated just alike. Serum constituted the only specific therapy and all serum was polyvalent. Typing was a long procedure involving two or three days. If a patient did not respond to the serum, a different lot of serum especially rich in antibodies for that particular meningococcus was obtained. This was determined by agglutination and was the only way in which typing meningococci bore direct relation to the treatment of a given case. Very little use was made of the knowledge gained by typing in treating the individual patient. If polyvalent serum were going to be given anyway it is no wonder that many small laboratories, equipped to handle only the most essential procedures, have never felt that typing meningococci was one of the things necessary to do.

This same point of view is held now in many places in regard to the cases treated with sulfonamides. If all are to receive these "sulfa" drugs, why spend time and effort in typing the meningococci involved? There are times and circumstances when such a view is undoubtedly sound. For example, in Army camps cases are apt to occur in bunches, all due to the same strain. The patients will be young men in the most favorable age group, and it will be only an exceptional case that does not respond to the sulfa drugs used. In acute epidemics in institutions, school, or military establishments where one strain is presumably involved and the age group of those affected is favorable, an overworked laboratory

staff may be justified in carrying its study of an individual case no further than a Gram-stained smear from spinal fluid. Although such a limited procedure is not recommended, the necessity for it is recognized at times. Quite a different situation may be found in the civilian population, especially during the years between epidemics when sporadic cases are the rule. These last may be due to a great variety of strains.

All meningococci do not respond alike either to sulfa drugs or to antiserum. As far as the sulfonamides are concerned this is an individual strain difference,[20] and not a property of any serological group as a whole. A strain that is responsive to one sulfa drug is usually responsive to all; a strain that is resistant to one is resistant to all. Not only do we meet some cases due to drug-resistant strains of meningococci but occasionally strains become drug-fast, a few people are drug-sensitive, and there are sometimes contraindications to giving large amounts of sulfa drugs, especially in the very old, the very young, and in persons with liver or kidney damage, or with sensitive hematopoietic systems. In such instances specific antiserum may be an important adjunct in therapy. It is important to type meningococci under any circumstance in which there is a possibility of using serum.

A brief discussion of serum may be appropriately included here. Different groups of meningococci are quite distinct immunologically. Serum prepared for one group will not protect against meningococci of another serological group. A serum must, therefore, be specific for the group of meningococcus involved, or else adequately polyvalent. A polyvalent serum that has an adequately high antibody content for all groups is difficult and expensive to make. It is especially hard to produce a good titer for Group II. Monovalent sera, refined and concentrated, are far simpler to produce, especially when prepared in rabbits. They are experimentally more effective, having often a protective titer of 5 to 10 times that of whole, polyvalent horse serum.[21] A practical plan to follow, especially in sporadic cases, is to type the meningococci involved and if the patients do not respond to sulfonamides within 24 hours, add an appropriate monovalent serum to the treatment. Since very few cases will need serum it should be possible to build up supplies of high potent sera specific for the types involved and to store them at low temperatures in a dried state to be ready when the need for them arises.

Whether or not it is advisable to type the meningococci from all patients for the sake of the few cases in which this knowledge will be applied therapeutically is a question each laboratory must settle individually. With the development of monovalent, concentrated and refined antiserum we have, for the first time, a means of applying our knowledge of the type of meningococcus to the treatment of the patient. With the few patients in which this application is made, typing the strains may make the difference between life and death.

It is possible that penicillin may change this picture. Recent reports indicate that it is very successful in treating meningococcus infections.[22] However, until we are more certain about this we should not discard all other agents. No penicillin-resistant strains of meningococcus have been reported thus far, but we have encountered a penicillin-resistant gonococcus.*

During the present epidemic wave of meningococcus infection there has been more typing better done than ever before. The Meningitis Commission

* Since this article was set, a penicillin-resistant meningococcus belonging to Group II has been received from one of the Army camps.

has typed all strains recovered in the Army, both those from cases and those found in intensive carrier studies. This Commission has accumulated a wealth of epidemiological material.

Typing meningococci is much easier and quicker than ever before. Laborious absorption of agglutinins to separate Group I into Types I and III is unnecessary. The Neufeld quellung reaction can often be used directly on spinal fluids from untreated cases provided there are enough organisms present to be seen.[23] If this quellung reaction cannot be done directly on spinal fluid it may be used on the very young culture. This, of course, applies only to encapsulated strains. So far no capsules have been shown on Group II cells, but only on those of Groups I and II *alpha*.

The rapid agglutination test described some years ago by Noble[24] has recently been adopted by the Meningitis Commission for use with the chicken sera introduced for typing by Phair and his coworkers.[25] Typing serum can be prepared more rapidly in chickens than in rabbits and, since the chickens are not susceptible to the meningococcus, they can tolerate tremendous injections. This makes them especially useful in preparing sera for Group II strains which are notably poor antigens.

With the coöperation of the biological houses, the National Institute of Health has undertaken the control of meningococcus typing sera so that dependable typing sera can be obtained. Minimum requirements for typing serum have been set up.[26]

There is as much to be gained by typing as ever before. With easier and quicker methods available it would seem that at the present time routine typing of meningococci is a desirable practice to follow in all laboratories where such a procedure is practicable. Each laboratory will necessarily decide this question for itself. Most of our knowledge of the meningococcus has come as a result of typing and we cannot tell what new and helpful information may lie ahead.

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School of Public Health at Minnesota

The regents of the University of Minnesota Medical School, Minneapolis, Minn., have recently changed the status of the department of preventive medicine and public health to the School of Public Health. The change was made to give proper recognition to a department which has been for a number of years offering professional training in public health for physicians, engineers, and nurses, and more recently for health educators. The School of Public Health will continue to function as an integral part of the medical school and the university Division of Medical Sciences. A building program planned at the university eventually will include a separate unit for the School of Public Health.

Gaylord W. Anderson, M.D., professor and head of the department of preventive medicine and public health, on leave of absence as Lieutenant Colonel, Medical Corps, Army of the United States, and chief of the Division of Medical Intelligence, Office of the Surgeon General, has been named director of the new School of Public Health. In January, Dr. Haven Emerson, New York, returned to the medical school as visiting professor of public health to serve, according to present plans, for the year 1945. During the leave of Dr. Anderson, Dr. Emerson has served in a similar capacity.

An Industrial Health Program for Federal Employees*

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THE United States Government is one of the largest single employers of civilian workers in the world. The government has done much to stimulate health programs for workers in private industry. The time is overdue when it should establish a sound health program for its own employees.

Illness caused an average loss of 10.2 days per employee in one large government department in 1942. The National Association of Manufacturers reports that the installation of medical and health programs in 234 industrial establishments was accompanied by a 29.7 per cent reduction in absences due to sickness (other than occupational disease). If this one federal department could improve its illness record by 3 days per employee, more than 246,000 man-days would be saved—the equivalent of 820 employees' full-time services for one year.

In these days of man power shortages, no employer should be in a position where he is hiring additional people in the open labor market simply because he refuses to put into effect a health program for his employees. Certainly, the federal government, functioning in the capacity of an employer, should not be in such a position.

H.R. 5257,† now pending in Congress, will, if enacted into law, give departments and agencies the authority, within the limits of their appropriations, to establish health programs for their workers. It reads as follows:

A BILL

To provide for health programs for Government employees.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, for the purpose of promoting and maintaining the physical and mental fitness of employees of the Federal Government, the heads of departments and agencies, including Government-owned and controlled corporations are authorized, within the limits of appropriations made available therefor, to establish by contract or otherwise health programs which will provide health services for employees under their respective jurisdictions: Provided, That such health programs as are now being conducted for Federal employees may be continued until June 30, 1945. The health services provided for Federal employees shall be established only upon recommendation of the Civil Service Commission after consultation with the Public Health Service and shall be limited to (1) treatments of minor illnesses and dental conditions except in cases of emergency or of injury or illness sustained while in the performance of the employee's duty in accordance with the Act of September 7, 1916, entitled "An Act to provide compensation for employees of the United States suffering injuries while in the performance of their duties, and for other purposes," as amended (U. S. C., 1940 edition, title 5, ch. 15); (2) preemployment and other examinations; (3) referral of employees to private physicians and dentists; and (4) education and preventive programs relating to health, including the alleviation of health hazards

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 3, 1944.

† H. R. 5257 was introduced in the 78th Congress. H. R. 284 is now pending in the 79th Congress. In H. R. 284 Section 2 is deleted and June 30, 1946, has been substituted for June 30, 1945.

in the working environment. The Civil Service Commission shall serve as a coordinating agency in the development of such services for all Federal employees and, in collaboration with the Public Health Service, with respect to the extent to which such services shall be available to employees.

Sec. 2. This Act shall not apply to the Tennessee Valley Authority.

Wartime employment in the federal government has brought to light and accentuated a long-standing need of health programs for government workers. The federal government, as an employer, has a definite responsibility in meeting the health problems of government workers. These problems in most instances have been dealt with inadequately in the past in the various departments and agencies. Although emergency rooms, under the supervision of graduate nurses, have contributed in some degree to increased efficiency of government employees, they have not met the needs of federal employees, and the federal government is in the position of rendering services which fall far below those of private industry. No agency-wide legal authority has existed in government for furnishing federal employees with health programs such as those found in private employment.

Providing health services to government employees is primarily a question of promoting and maintaining their physical and mental welfare. Savings resulting from reduction of occupational diseases, accident frequency, and absenteeism are directly related to the overall principle of maintaining and conserving human resources. In government offices and shops, ample provision has been made for the maintenance of machinery and tools. There is a need for giving at least an equal amount of attention to the human beings who use the machinery and tools.

The departments and agencies of the federal government are taking the lead in providing disabled veterans with opportunities for employment. They will be faced with problems in placement and postplacement adjustment of veterans which will require that operating officials have health services, with competent medical personnel available for consultation.

The scope and standards of health programs should be consistent with:

A. Purpose of the department or agency
B. The federal government's responsibility as fixed by the Employees' Compensation Act of 1916, as amended
C. The employee's natural allegiance to his family physician
D. The accepted limits placed upon industrial medicine

The physician in charge of the program should be the health officer of the organization and should be highly qualified in the field of industrial medicine. His responsibilities and the scope of his program would be divided into three main categories:

I. Preventive services
II. Advisory and diagnostic services
III. Treatment

Such a program would be accomplished through the following:

I. *Preventive services*
  A. Health examinations
    1. Preplacement
      (a) Original
      (b) Reassignment
    2. Periodic
    3. After illness
    4. To determine fitness for continuing assignment, separation, change of duty, or retirement

The purpose of health examinations in an industrial health program for federal employees is to aid in the judicious placement of workers in jobs they can perform efficiently without being a hazard to themselves or others. Such examinations should not be used as a tool for unjust exclusion or to narrow the field of competition.

B. Promotion of adequate environmental hygiene
   1. Sufficient lighting and ventilation, safe water supply, proper distribution of food and disposal of garbage, and insect and rodent control
   2. Fatigue prevention measures—such as noise reduction, adequate rest periods, vacations, refreshments, and posture aids
   3. Elimination or control of specific occupational hazards due to certain solvents, gases, dusts, and other allied causes

C. Control of communicable diseases
   1. Tuberculosis
   2. Venereal diseases
   3. Others

D. Mental hygiene
   Cases of workers who show indications of emotional disturbances would be referred to the physician in charge for study

E. Health education in which various media are used in presenting such subjects as:
   1. Nutrition
   2. Health hazards (seasonal and general)
   3. Physical fitness
   4. Communicable diseases
   5. First aid

F. Health records
   These should be confidential and kept in the Health Unit.

II. *Advisory and diagnostic services*

A. Acquainting the worker with his physical condition and assisting him in maintaining good health

B. Evaluation of employee's symptoms and referral to private physician

III. *Treatment*

A. Prompt and efficient handling of illnesses and injuries occurring while employees are on duty by providing treatment on the spot and referral to proper facilities for complete and adequate care

B. Treatment, on the job, of minor non-compensable injuries and diseases, with the object of keeping employees at work

C. Emergency care for serious non-service-connected injuries or diseases, and referral to a private physician or hospital

D. Special treatments to be given only upon the written request of the employee's private physician

In order for such a health program to function efficiently it should be placed administratively as high in the organization as feasible to enable the physician in charge to have access to top management, and to insure close cooperation with the personnel, safety, and other divisions of the agency which may be concerned.

With regard to the personnel necessary for the efficient operation of the program, there should be at least one medical officer per 4,000 to 6,000 employees, the exact ratio depending upon such factors as distribution of employees, number of shifts worked, extent of industrial hazards, employee turnover, etc. Nurses required should be on the basis of one per 500 to 1,000 employees, the ratio depending upon the above mentioned factors. The number of stenographic, clerical, and other types of supporting personnel would depend upon case load, number of rooms, distribution of employees, etc., but in any event the number should be adequate to avoid the necessity of doctors and nurses performing routine clerical and other non-medical duties.

In considering these programs, it is well to emphasize that the proposed legislation, providing health services in government departments and agencies, is not intended to displace the private physician's services to government employees in the community. One of the purposes of the programs is to aid the private physician in maintaining contact with regular patients who are in need of medical treatment and observation. New patients who have been found to require medical treatment and observation would be referred to him. If, in such a program, emphasis were placed on treatment to such an extent as to exclude proper referral to private physicians, the program would become

enmeshed in procedure; its proper function would be hindered and its purpose destroyed.

The establishment of health programs for government workers would permit government agencies to conserve their human resources, as they now conserve their inanimate resources, and would be not only humanitarian but also "good business," because it would improve employee efficiency and morale.

Dr. Parran on Budgeting Nursing Resources

Speaking in favor of H. R. 1284 and H. R. 1666, Dr. Thomas Parran, Surgeon General, U. S. Public Health Service, on February 6 appeared before the House Committee on Military Affairs to discuss, among other things, minimum nursing service for the civilian population, its relationship to military needs, and the contribution which the U. S. Cadet Nurse Corps is making toward both military and civilian requirements for nurses.

Speaking in favor of the proposed draft of nurses, Dr. Parran said that the bill was not to be condemned as discriminatory in singling out this one profession for selective service, but rather that it gives merited recognition to the essentiality of the profession of nursing.

"Hospitals today are caring for the largest number of patients in their history, in spite of the fact that we have no widespread epidemics. . . . While some nurses can be withdrawn from hospital service, there is no large reservoir in this group. The Army should not accept nurses who are occupying positions which are really essential. There are two groups of nurses in particular where great damage may be done. Public health departments and visiting nurse associations employ approximately 21,000 nurses. None of them are over-staffed. In fact, this figure represents 20 to 30 per cent vacancies. Public health nurses constitute the largest single group among all health department employees. Without nurses, health departments cannot operate. Because many hospitals are overloaded, many sick patients are being cared for in their homes by visiting nurses. . . . We must continue, therefore, to supply a minimum number of graduates with minimum special preparation to fill key positions vacated in staffs of public health agencies and schools of nursing.

"As the war progresses, the major civilian health problems are still ahead of us. . . . In other words, there is bound to be a lower level of civilian health and greater susceptibility to disease. . . . The one most substantial source of nurse power is the private duty group, many of whom are performing non-essential tasks. . . . In my opinion almost every private duty nurse eligible for military duty can be spared, and those not eligible for military service should go into truly essential work. Our estimates as of June, 1944, show there were approximately 60,500 nurses doing private duty. . . . Should the Army be forced to recruit its quota indiscriminately, irreparable damage will be done to the entire nursing service structure—to the civilian front and, sooner than you think, to the military as well. . . . It is for these reasons that I recommend the selective service principle for professional nurses to include minimum civilian as well as total military needs. This is total war. We must mobilize fully to guard against collapse on any front, military or civilian. . . . We have heard gripping stories of the valiant service being rendered by our nurses at the battlefronts. In many hospitals and public health agencies at home, too, they are working beyond the limit of continued human endurance. Their work would not be too heavy if it were shared evenly. . . . The national health and safety demands that our limited nursing skills be budgeted wisely so that our sick and injured may have the best opportunity for life and health."

Future Implications of the Nutritive Value of the American Wartime Diet*

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PROBABLY never before in the history of this country has more information been available concerning the nutritive value of the American diet, that is, the nutritive value of the average American diet. Putting it in another way, we have better information than ever before concerning the total quantities of food and nutrients moving into or available for civilian consumption, and by dividing up these quantities among the population we can determine how adequate such a diet would be. It goes without saying that for a variety of reasons this food and these nutrients are not divided up according to nutritional requirements, so that after ascertaining whether total quantities available for civilian consumption would be adequate if each individual received his share, we must carry out dietary studies to determine the actual diets of the various social, economic, and geographical groups which make up our population. On this important subject we have rather less information than we had before the war since fewer and fewer adequate dietary surveys have been carried out in recent years. This is a serious gap in our knowledge.

It is well to recall that the United Nations Conference on Food and Agriculture at Hot Springs recommended, as a first step in the formulation of national nutrition policy, the setting up of a national nutrition organization whose duty it would be to ascertain food consumption habits; that is, to conduct dietary surveys, and to study the nutritional status of different sections of the population.

It was the government of this country which convened the Hot Springs Conference, and it should be the first government to carry out the spirit and intent of the recommendations which its technical delegates promoted and accepted with so much zeal.

The appraisal of the nutritive value of the American diet in wartime will not be complete until we have studied the nutritional status of representative samples of the American population, for the object of food production and distribution is to maintain the best nutritional status and the highest degree of health which can be achieved by dietary means. Here again there are considerable gaps in our knowledge, since the public health authorities have not carried out systematic studies of the nutritional status of different sections of the population. Surveys by private groups have to some extent helped to fill in this gap in our knowledge.

Let us now compare pre-war and wartime "total supplies of food moving into civilian consumption, measured at the point where they enter the consumer's hands and divided by the total civilian population." These will be referred to hereinafter as "per capita

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supplies," and it should be remembered that they are greater than the quantities of food actually eaten because of losses in preparation and cooking.

I have obtained the facts which follow from a report prepared by a special committee set up by the Combined Food Board in consequence of a joint statement issued by the President of the United States and the Prime Minister of the United Kingdom in June, 1942, that "in principle, the entire food resources of Great Britain and the United States will be deemed to be a common pool." "It soon became apparent" in the words of the report, "that this could be done only if more complete and comparable information were available on the rates of consumption in the countries concerned." Hence a special Joint Committee was set up by the Combined Food Board to secure the necessary data. The following information is drawn from that report.[1]

Pre-war supplies of calories moving into civilian consumption in this country were 128 per cent of requirements; in 1943 they were 130 per cent of requirements; that is, there was a slight increase. There was also an increase in the supplies of total protein available, from 137 per cent of requirements in pre-war years to 146 per cent in 1943. The increase in supplies of animal protein available was 9 per cent and in fat 5 per cent.

Of the important minerals, calcium in the consumed diets of the United States has risen by about 15 per cent and iron by 14 per cent.

As regards the vitamins there appears to have been a slight increase in the supplies of vitamins A and C available (+8 per cent and +7 per cent respectively). The supplies of thiamine have increased substantially since before the war (37 per cent), and those of riboflavin (18 per cent), and niacin (14 per cent) more moderately.

In terms of foods moving into civilian consumption in 1943 as compared to the pre-war position, there have been increases in milk and milk products; in meat, poultry, fish, and eggs, in leafy green and yellow vegetables and in tomatoes and citrus fruits. In fact, the only decreases in important foods have occurred in sugars and syrups and in tea, coffee, and cocoa. The supply levels of fats and oils have been approximately maintained.

Altogether this is a remarkable record. Such increases in the nutritive value of the average American diet during the war in spite of the large amounts of food allocated to the armed forces and for lend-lease reflects credit on farmers, food industries, transportation agencies, and government. Nutrition authorities, in and out of government, deserve special praise for their unremitting efforts to emphasize the need for better food and nutrition as contributions to the war effort. This is the bright side of the food and nutrition picture, reflecting great credit on all who have taken part in planning, producing, and distributing our food supplies.

But of course, there is another side to the picture, and it is from a close study of this less cheerful side that we can derive most profit for the future. Health workers should be particularly interested in the campaign against endemic goiter, one of the first nutritional deficiencies to be attacked successfully on a broad front. About a quarter of a century ago a vast educational campaign was under way, iodine tablets were distributed in many schools, surveys to determine the prevalence of endemic goiter were carried out, and efforts were made to insure that iodine was added to all table salt. Now education on this subject is neglected: iodine tablets are no longer distributed and only about 50 per cent of the table salt sold now contains added iodine. It would seem that while we may have

gone forward on many parts of the nutrition front, we have not been successful in preventing the enemy from filtering into our rear. Endemic goiter may be once more on the march. Three steps are necessary if we are to maintain the successes we have achieved: renewal of the educational campaign, so that there will be a demand for iodized salt; a survey to determine the present position of endemic goiter; and the more complete iodization of table salt. The Food and Nutrition Board of the National Research Council has recommended these three steps and I strongly urge the American Public Health Association to take up the challenge.

Now we come to the question, how much have individuals profited from these increased supplies of foods and nutrients available for civilian consumption, for it must be emphasized that none of the figures given above represent the actual supply received by any individual consumer.

Partial answers to that question may be obtained from studies of family food consumption in the United States carried out by the Bureau of Human Nutrition and Home Economics. I quote from the latest report.[2]

> In 1936 three-fourths of the families in the United States had diets that did not meet the National Research Council recommendations for riboflavin and about half had diets that were low in calcium, thiamine, and ascorbic acid. It is estimated that in the spring of 1942 the diets of more than one-half of the families still did not meet the recommended allowances for riboflavin and that the proportion of diets low in calcium had been reduced to less than a third; the proportion low in thiamine, to a fourth; and the proportion low in ascorbic acid, in which there was the greatest improvement, to less than a tenth. There was also a great reduction in the estimated proportion of families that had diets low in vitamin A value, iron, and protein—from one-fourth in the earlier period to about one-tenth in the later period.

As Dr. Esther Phipard has said "these facts lend support to the general trend toward dietary improvement indicated by the averages for the United States as a whole. They suggest also that the job is not finished. . . . There are still thousands of families with incomes too low to purchase a fully adequate diet."[3]

The tragedy is that the government does not carry out systematic dietary studies on a sufficiently broad scale to locate such families and provide for their needs.

As regards surveys of nutritional status it is virtually impossible to make any valid comparisons as between the pre-war and war years. It is to be hoped that this gap in our knowledge will be remedied in future, so that we may have some means of measuring progress. It is to be noted that experienced physicians in regions of the South where pellagra has been most prevalent state that it is becoming ever more difficult to locate cases for teaching purposes.

We may now ask ourselves, why did the nutritive value of the American diet experience this improvement in wartime? In general it is clear that the improvement was due to the rapid advances in our knowledge of food and nutrition; these in turn being based on the fundamental work of food and nutrition scientists. It is evident that advances in fundamental science are potentially capable of bringing about the greatest improvement in human health and welfare. It would appear to be the part of wisdom to increase our efforts during the post-war years, training more workers and providing ample funds and facilities for fundamental research. This research should relate to human requirements as well as to the nature of foods; the physician and public health worker as well as the biochemist should be led to greater interest in the physiology of human nutrition.

The second cause of improved diets in wartime has been better management of our food resources. Before the war began, the Food and Nutrition Board of the National Research Council adopted tables of dietary allowances which have been used increasingly as standards of reference for production goals, for the rations of the armed forces, and for the calculation of dietary needs among liberated peoples abroad. There is great advantage in having a suitable goal for nutrition, and this has been furnished by the dietary allowances of the Food and Nutrition Board.

Certain specific measures furnish good examples of improvements which may be brought about in food management by advances in the science of nutrition. It will have been noted that there was a marked wartime increase in the thiamine available for civilian consumption. This came about, in the work of the special Joint Committee from whose report I have been quoting, "because three quarters of the wheat flour are now enriched," and it should be added that practically all white bread is now enriched by order of the War Food Administration. Much of the increase in riboflavin and niacin and some of the increase in iron is due to the same cause. It is interesting to note the Joint Committee's explanation for the 50 per cent wartime increase in the calcium intake in the United Kingdom. The committee states, "Approximately one-third of the increase in the United Kingdom is attributed to increased consumption of dairy products; the remainder is mainly due to the addition of calcium carbonate to flour."

Food management has greatly profited from the improvement in the statistics of food production and distribution. It will profit still more when systematic dietary studies and the routine appraisal of the nutritional status of samples of the population are regularly carried out.

Further gains in the nutritive value of the American wartime diet would have been made possible by the retention in wartime of all the pre-war social measures for the distribution of food; free or cheap milk in schools, school lunches, and the food stamp plan. Unfortunately these were based on the existence of food surpluses rather than on nutritional need, so that when the increase of purchasing power did away with surpluses, it proved impossible to retain most of these measures. It must be admitted that the increase in purchasing power, while benefiting some, did not necessarily reach all. Vulnerable groups exist even in wartime, and failure to provide for their nutritional needs will prove costly in future years.

The chief lesson to be drawn from our wartime experience with food and nutrition is that the aims of the Conference on Food and Agriculture at Hot Springs are reasonable aims, aims which we can achieve without too much difficulty. Since we have succeeded in improving the nutritive quality of the American diet in wartime, when so many obstacles had to be overcome, and when so much of our food had to be diverted to our Allies and the armed forces, it should be much easier to effect similar improvements when these obstacles no longer exist.

The Conference at Hot Springs recommended that governments should "immediately undertake the task of increasing the food resources and improving the diets of their people." Each government was urged "to study the food consumption habits and the nutritional status of its population."[4] Once this information is available it should not be difficult for a rich country like ours to achieve the necessary production and to set about systematically improving the diets of the population groups whose diets do not measure up to optimal requirements. The low income groups in this coun-

try suffer disproportionately from sickness, and have generally unfavorable death rates. Infant mortality and tuberculosis death rates furnish strong evidence of the disadvantage under which the poor suffer. Bringing the diets of these groups more nearly up to full requirements will at a stroke wipe out one of their principal disadvantages. It will mean a public health advance comparable to that which took place when the teachings of Pasteur were first put into practice. And I have no doubt that concerted action among all like-minded nations to achieve freedom from want of food will prove one of the best ways of promoting that full measure of international coöperation which is required to preserve world civilization from chaos and anarchy.

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Washington Metropolitan Health Council

The Washington Metropolitan Health Council was recently created under the sponsorship of the health division of the Council of Social Agencies. One of its first activities will be a comprehensive survey of health and hospital facilities in Washington. Admiral Ross T. McIntire, Surgeon General of the Navy, is chairman of the survey committee. Dr. Herbert P. Ramsey is head of the health division of the Council of Social Agencies.

Current Tuberculosis Statistics in the United States*

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IN peacetime health workers have learned to expect a lowered death rate from tuberculosis each succeeding year, though they anticipate corresponding rises in wartime. Yet, even though 1942 and 1943 were war years, the tuberculosis death rate has continued to decline just as in peacetime; in fact, provisional data supplied by state health departments indicate that the tuberculosis death rate per 100,000 population in continental United States was 41.9 in 1943, compared with a final rate of 43.1 in 1942. This recent decrease was very reassuring in view of the expectation that wartime conditions would probably lead to a sizeable increase.

Such fragmentary data as are available for the first half of 1944 indicate that tuberculosis mortality is approximately the same as it was in the similar period of 1943. According to the Metropolitan Life Insurance Company, the death rate from tuberculosis was 42.6 per 100,000 industrial policy holders during the first seven months of 1944, compared with a rate of 41.5 for the same months of 1943. This very slight advance is offset by the fact that the current mortality analysis of the Bureau of the Census, based on a 10 per cent sample, shows an even more insignificant *decline* in the first half of 1944.

Early this year it appeared that the long expected rise in tuberculosis mortality had actually materialized, since deaths in January were decidedly more numerous than in January, 1943. As 1944 progressed, however, it became evident that this sporadic increase in January was traceable to the wave of influenza and acute respiratory infections which swept the country in that month. Whether tuberculosis mortality will decline sufficiently in the latter half of 1944 to level off the January increase is problematical.

The tuberculosis death rate for 1944 will be materially affected by a factor not always given sufficient consideration. I am referring not to the number of deaths from tuberculosis which will have occurred during the year but to the fact that 5,500,000 of our healthiest young men and women were assigned outside continental United States on July 1, 1944; for that reason they are excluded from the population estimates on which death rates are to be based.

In the case of tuberculosis mortality this current practice of subtracting the number of men assigned overseas from the population estimates has a rather striking effect. Since practically all young persons serving abroad with the armed forces were x-rayed prior to their induction, it is obvious that very few deaths from tuberculosis are to be ex-

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pected among their number in the next year or two.

For example, the population of the entire country on July 1, 1943, was estimated to be 133,942,410; this figure includes members of the armed forces stationed in this country but excludes those assigned outside continental United States on that date. By comparing this population estimate with the 56,178 deaths from tuberculosis in 1943 we get a death rate of 41.9 per 100,000 population.

On the other hand, the *country's total population including members of the armed forces stationed overseas* was 136,485,262 on July 1, 1943, according to the Census Bureau. Everyone must admit that only an infinitesimal number of deaths from tuberculosis was to have been expected in 1943 among the 2,542,852 members of the armed forces stationed outside continental United States since all had been x-rayed prior to their relatively recent induction.

Therefore, if the total population figure of 136,485,262 had been related to the 56,178 deaths from tuberculosis, the 1943 death rate would have been 41.2 instead of 41.9. In other words, the exclusion of 2,500,000 of the healthiest young men from the population estimate for the country has a definite tendency to result in an *apparently* increased death rate in the United States and in each state. This statement applies with particular emphasis to tuberculosis mortality because such intensive efforts were made to exclude tuberculous persons from the armed forces.

The tendency toward an apparent (rather than real) rise in the death rate will become far more noticeable when the 1944 rate is computed since at least 5,500,000 of the persons least liable to die of tuberculosis were stationed outside the country on July 1, 1944. If the same number of persons were to die of the disease in 1944 as in 1943, use of a population base which excludes 5,500,000 would result in a death rate of 42.9 instead of 41.9.

In spite of the fact that in continental United States the provisional death rate from tuberculosis was 2.8 per cent lower in 1943 than the final death rate for 1942, the 1943 mortality from the disease represented an increase in 21 states when compared with their rates for 1942.

The most interesting trend noted in 1943 is the fact that so many of these increased death rates are concentrated in the industrial states of the northeastern and north central sections of the country, while even more pronounced declines are observed in the states of the South and West.

According to one theory, these increased rates in our industrial states may presage rising mortality from tuberculosis in the country as a whole; others are of the opinion that the stupendous migration of the past few years may have resulted in a realignment of the American people—to some extent, at least, on health grounds. Only time can determine which of these two hypotheses is correct.

The abnormal conditions incident to the war have affected the population distribution in the states more than is usually realized. Internal migration, both civilian and military, has resulted in decreased population in the northeastern and north central states, while in the South and West the population has increased materially since the date of the last decennial census in 1940.

In addition to the assignment of millions of our young people overseas, many more millions of healthy young citizens have likewise been assigned to training camps which are largely concentrated in the states of the South and Far West where climatic conditions facilitate military training throughout all months of the year.

Simultaneously other millions of all ages whose state of health is unknown have migrated to and fro without pattern in search of industrial employment. It is quite possible that this population upheaval which has no parallel in American history will affect the trend of tuberculosis mortality in the states for years to come.

The difficulties of computing sound death rates in these days of major population shifts cannot be appreciated until one makes an effort to obtain population estimates for a given date, to evaluate the extent of the changes in a given community, and to analyze the effect of the population changes on the death rates.

Changes in the *size* of a state's population are allowed for when death rates are computed on the basis of the best available population estimates. But changes in the *age, sex, and color composition* of the population cannot be taken into consideration until a new population census has been taken; and no population census will prove to be worth while until the people of the country have had a few years to settle down after the war.

Discussion

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I BELIEVE my assignment in opening the discussion of Miss Dempsey's paper is to bring into line a short report on the current experience of tuberculosis trends in Canada during the war period. The figures are not available at the present time to assess fully the effect of wartime conditions upon tuberculosis in our country. In fact, it is questionable whether the true effect of many of these conditions can be accurately measured with our existing facilities and at the present time we have only four criteria which may be used to measure some of the important factors which have a bearing on the trend of tuberculosis. These are:

1. The death rate
2. Case finding or reported known cases
3. Hospitalization
4. The stage of the disease at the time of diagnosis

DEATH RATES

Our Canadian figures show that for the five years prior to the war period the mortality rate from tuberculosis decreased from 60 to 53 per 100,000 population, while the rates for the four years 1940 to 1943, inclusive, were respectively 51, 53, 51, and 52 per 100,000. The 1943 figure which shows a slight increase over 1942 when broken down according to provinces, shows that eight of the provinces recorded increases in the death rate while one showed a decrease.

CASE FINDING

The number of reported new tuberculous infections has increased in the Dominion from 9,090 in 1938 to 12,361 in 1943. The increase in the incidence, however, should not be measured by the difference in these figures as the comparability factor has been disturbed to an appreciable degree by mass surveys. For instance, in 1943, 380,000 persons were examined in the clinics throughout the country and by mass surveys.

Out of a total population of 11,500,000, 1,500,000 have been x-rayed in the Armed Forces since the war started. In both these groups, approximately 10 per

1,000 persons examined showed tuberculosis, and 3 per 1,000 examined had active tuberculosis.

In the Dominion Civil Service 30,260 employees were x-rayed in 1943, and were found to have a tuberculosis rate of 19 per 1,000 examined. The active rate for this group was 4 per 1,000 examined.

It is interesting to note that in the August 12, 1944, issue of the *Medical Officer*, published in England, W. B. Brooks reports the results of his investigation of 473,372 male ratings, of which number, 12.7 per 1,000 showed abnormal radiological shadows, 6.1 per 1,000 were minimal adult type of pulmonary tuberculosis, and 0.9 per 1,000 examined were active.

Of 23,000 Wrens 9.1 per 1,000 showed abnormal shadows and 0.9 per 1,000 were active cases of tuberculosis. These were all apparently healthy and had undergone routine physical examinations before joining the Navy.

While the rate of cases found in the Civil Service survey is high when compared with other surveys of selected groups of population, it must be remembered that this group is not only drawn from all parts of Canada but they represent (1) a group of people who have never been examined previously for tuberculosis; and (2) a group which have been excluded from military service on account of physical defects, so it would appear that a higher rate of tuberculosis incidence in this group was to have been expected.

HOSPITALIZATION

One of the real problems in Canada today in the battle against tuberculosis is the shortage of beds. The Canadian Tuberculosis Association, in a recent survey of the situation, found that 8,000 more beds were required in the sanatoria immediately. Another problem in hospitalization has been the shortage of staff personnel. The sanatoria are now operating with only 86 per cent of the staff positions filled, as judged by pre-war standards. There has been relatively little change in the number of beds in use—an increase of 10.7 per cent in four years. The number of persons under care has been increased in approximately the same proportions.

STAGE OF DISEASE AT TIME OF DIAGNOSIS

In reviewing our Canadian statistics under this particular heading with regard to tuberculosis, we find some very encouraging factors. The percentage of minimal cases admitted to the sanatoria has increased from 17.5 in 1939 to 21.9 in 1942, while the percentage of those whose condition was far advanced has decreased from 50.4 to 44.5.

A marked improvement has been shown in some of the provinces in the time elapsed between diagnosis and admission to sanatoria. The percentage admitted within one month of diagnosis has increased from 55 to 89 per cent in Ontario, from 48 to 85 per cent in Alberta, and from 47 to 91 per cent in British Columbia.

These four factors would seem to indicate that while the general downward trend of the death rate has been arrested, there is every evidence of an improvement in the general situation. There are no indications of any greater increase in the industrial areas compared with the rural and other urban sections of the country, but we must remember that it may be too early yet to measure the ultimate effect upon tuberculosis in Canada of the longer hours and increased tempo of working conditions under the impetus of war.

The policy of x-raying all recruits for the armed forces would appear to have been more than justified. Relatively few cases of tuberculosis have developed during the first eighteen months following enlistment. While there has

been a tendency for the incidence of pulmonary tuberculosis to rise as time goes on, this incidence is still markedly below that in the civilian population.

A point that might be of some interest is the policy in regard to the treatment of the tuberculous veteran. Following World War I, the policy was adopted of utilizing provincial tuberculosis services. There has been no change in this policy and only where beds are not available are tuberculous veterans treated in veterans' hospitals.

This policy avoids duplication, assures the veteran of the best tuberculosis services available, and it is believed that the veteran is more likely to remain on treatment as long as required, than when treatment is undertaken in veterans' hospitals. Another advantage is that the same services will be treating the veteran as will be carrying out the supervision of the veteran's family.

We trust that the present levelling off of the death rate curve is merely one of those periodic halts in its downward trend.

Dr. A. B. Wadsworth Retires

The retirement of Dr. Augustus B. Wadsworth, Director of the Division of Laboratories and Research of the New York State Department of Health, Albany, after 31 years of continuous service was announced by Edward S. Godfrey, Jr., M.D., State Commissioner of Health, on February 1. Dr. Wadsworth assumed charge of the laboratory service of the state in 1914 when the laboratory included nothing more than a converted stable and a frame dwelling and had a staff of 17 persons carrying on limited activities. Under his direction the laboratory has grown into a modern institution, recognized throughout the country and abroad as a leader in the field. The state laboratory, together with a system of approved local laboratories now numbering 125 in the state, made in a recent year more than 6,000,000 examinations.

Dr. Wadsworth joined the Association and the Laboratory Section in 1914 and has been a Charter Fellow since 1922. He has served the Section in many offices, most recently as Section Archivist.

Veterans' Preference in Public Health Agencies of the United States

Declaration by the Committee on Professional Education American Public Health Association *

THE Committee on Professional Education, in conformity with its charter, is carrying out studies and research in the problems of public health as they affect the qualifications and experience of the persons employed. It is apparent that the matter of preference for veterans will constitute an important consideration in the near future and, in response to requests from civil service and merit system agencies, the committee records its considered judgment as follows:

The proper placement of returning veterans who may be interested in entering or reëntering the public health field represents an important obligation which must be intelligently handled. Those responsible for the establishment of personnel procedures in public health share with all personnel administrators an obligation to give due consideration to the claims which returning veterans have for vocational placement in public health. Veterans may rightly expect some special consideration. It is a challenge to every personnel administrator to put to the best use in the public service the abilities and aptitudes which unquestionably exist among the veterans.

One aspect of this problem which is of immediate concern is the attempt to meet it by the enactment of legislation giving varying degrees of preference to veterans seeking employment in the public service. In the majority of states, and in the federal government as well, the question of whether or not veterans should be given such preference has been decided in the affirmative. It remains now to frame legislation which will be reasonable and fair so that it will jeopardize neither the vocational future of the veterans themselves by placing them in positions for which they may not be qualified, nor the effectiveness of the institutions which serve them and all other citizens.

The Committee on Professional Education finds itself in agreement with the conclusions reached by the Executive Council of the Civil Service Assembly of the United States and Canada which has pointed out that, in shaping public policies for the speedy and effective reabsorption of demobilized veterans into civil life, the nation's citizens now face a problem which must be solved promptly and wisely. In so doing they will wish to deal fairly with the men and women who comprise our armed forces and at the same time to maintain the efficiency of the public services in the United States, federal, state, and local.

Of the 12,000,000 or more veterans who will return to civilian life during and after the war, there will be several thousand who will enter public service in the various specialties of public health. Among these there will be young men and women with well prepared minds, indomitable energy,

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splendid character, and many specialized aptitudes and skills. Most of them will return with capacities unimpaired and with an increased appreciation for the American way of life. We share with the Civil Service Assembly a conviction that with them we can build a public service better than any we have known before. In so doing, however, we must be wise enough not to blunder into excesses of special privilege and administrative practice which experience shows would critically impair the efficiency of the public service and thereby damage the very institutions which these veterans have risked their lives to preserve.

The Committee on Professional Education desires to associate itself with the Civil Service Assembly in the following statement of policy:

The problem resolves itself into three major components as follows:

A. The development of equitable and administratively practicable policies for the reinstatement of employees who have left their civil service positions to enter the military service.

B. The development of sound and reasonable policies in those instances where responsible policy-forming bodies deem it to be in the public interest to afford certain degrees of preference to war veterans who seek to enter the public service.

C. The adjustment of administrative policies and procedures of public personnel agencies to facilitate veteran rehabilitation to the fullest extent possible.

RECOMMENDATIONS REGARDING REINSTATEMENT OF FORMER EMPLOYEES

1. Public employees who have achieved permanent status in their positions, and who are on military leave, should be entitled upon demobilization to reinstatement or reëmployment in their former positions or in similar positions. They should be required to make application for reëmployment within 90 days after their discharge or release from military service.

2. Employees who return from military leave should be entitled to the privileges that would have been accorded them had they continued in their civil positions, including annual salary increments for satisfactory service, when such increments are authorized by law; seniority credit for continuity in the civil service; eligibility to compete in promotional examinations given during their absence, and for which they would otherwise have been eligible; sick and vacation leave accrued and unused by the employee at the time of entrance into the military service; and credit toward civil retirement for the period of military service.

3. Returning employees who have been disabled during their military service to the extent that they are incapacitated for performing their former duties should, wherever possible, be readjusted in the service by reassignment or transfer to other duties for which they are qualified.

4. Requests of employees returning from military service who seek leave to avail themselves of veteran benefits, such as attendance in educational institutions, should be considered on the same basis as other requests for leave of absence which take into account the administrative necessities of the public service.

RECOMMENDATIONS REGARDING THE SUBSTANCE OF VETERANS' PREFERENCE POLICIES

5. Veterans' preference policies that may be adopted should recognize the democratic principle of open competition for public employment on the basis of merit and fitness, and should not by their terms or operations serve to exclude unduly the rising generation from

its rightful opportunity for public employment.

6. The term "veteran," as used in this report, should be understood to mean a person who has been a member of the armed forces during the period of actual hostilities.

7. Veteran preference policies should include the maintenance of proper minimum qualifications and standards for entrance to the public service.

8. Veterans should be required to obtain a passing mark in competitive tests before being entitled to preference consideration.

9. Preference should be confined to examinations for entrance into the service, and should not be applied to promotions within the service.

10. Preference should take the form of credit points added to the earned examination rating, and the veteran's standing on the eligible list should be determined on the basis of such augmented rating. While the disabled veteran may appropriately be given an added margin of preference in the form of a greater number of credit points added to his earned rating, no veteran should be entitled to be placed automatically at the top of the eligible list unless his augmented rating places him there.

11. The amount of preference credit to be given to non-disabled veterans should be not more than 5 credit points on the basis of 100, and the amount of preference credit given to disabled veterans should be not more than 10 credit points on the same basis.

12. The right of a veteran to additional point preference for disability should be based on the findings of the United States Veterans' Administration, and should be accorded only to those veterans who have at least a 10 per cent compensable disability rating. The disability should be compensable at the time of the veteran's application for preference.

13. Preference for veterans should be limited to a period of five years after the war, or five years after discharge or release from war service, whichever date is later.

14. Retention in the service in the case of reduction in force or abolition of positions for lack of work or funds should continue to be based solely on ability properly to perform the duties of the position, and on relative length of efficient service.

RECOMMENDATIONS REGARDING ADMINISTRATIVE POLICIES OF PUBLIC PERSONNEL AGENCIES RELATING TO VETERANS

15. Experience gained in military service should be properly evaluated and considered in determining the qualifications of candidates for positions to which such experience is relevant.

16. Training and education received through official military agencies should be properly evaluated and recognized in giving credit toward civil service eligibility and in rating education and experience.

17. Programs of instruction given during or after military service designed to equip veterans for public service careers should be given legislative support and administrative recognition.

18. Public personnel agencies should seek to integrate their own facilities with those of officially designated veteran facilities in their respective jurisdictions to promote efficiency in veteran placement, training, counseling, rehabilitation, and other similar aids to veterans.

The Committee on Professional Education believes that these recommendations are sound and practicable for public employment of nonprofessional personnel, and considers that adherence to them is fair and reasonable in the case of many of the positions in public health departments. At the same time, the committee wishes to record its con-

sidered opinion that no form of veterans' preference should be adopted which will interfere with the selection of highly qualified persons in professional positions. It cannot be too strongly urged that life and death depend upon the decisions and actions of many of those charged with the protection of the public health. It is therefore imperative that the best available person should be entrusted with this responsibility. This is especially true in positions which involve policy making or in which critical decisions must be made. With these considerations in mind, the committee concludes that absolute preference cannot be defended in the case of professional positions in the public health field. The justifiability of this position has been recognized by the United States Congress in the formulation of the Federal Veterans' Preference Act which provides no absolute preference for professional and scientific services for which the entrance salary is over $3,000 per annum. For the sake of the public good, including that of the veterans who will constitute a very substantial part of the post-war population, nothing must be allowed to interfere with the development of the highest type of service from those responsible for the public health.

Children's Bureau Plans for the Future

The *32nd Annual Report* of the Secretary of Labor, recently published in Washington, is concerned in an important way with the activities of the Children's Bureau. "As the time for final victory draws nearer, the Bureau, in coöperation with other agencies, has begun to explore some of the ways in which demobilization and reconversion will affect family life and the welfare of children and youth, and the measures that will be necessary to assure the health, education, and welfare of children and young people throughout the nation."

The recommendations of the report on health services and medical care for mothers and children are as follows:

1. Legislation should be enacted, separately or as part of an inclusive national health program, to provide federal aid to the states to enable them to expand existing health services and provide additional services for maternity care and for health supervision and medical care of children from birth through adolescence. Such services should be fully available in every county or other local administrative unit in the United States.

2. Medical care programs should be developed around health centers and hospitals in which facilities for diagnosis, consultation, and health education are fully available. The program should include the organization and development of health and medical services for school children, including those in high school, through health services in the schools and diagnostic and treatment services in the community.

3. The crippled children's program, which now reaches only a minority of children in need of special attention, should be expanded so that all physically handicapped children in need of service will have access to it. Special emphasis should be given to a nation-wide plan for care of children with rheumatic fever and with heart disease resulting from rheumatic fever, one of the most important causes of death in childhood.

Engineering Technique Applied to Restaurant Sanitation*

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AN analysis of recently intensified efforts of many health officials to secure better restaurant sanitation reveals (1) the fundamental soundness of an educational approach, and (2) the necessity for the immediate development and application of more effective sanitary engineering design and control of physical factors.

It is not my purpose to discuss the pros and cons of the educational approach to restaurant sanitation, except to point out that one phase of a restaurant sanitation educational program requires not only a knowledge of why certain conditions are unsafe but also the ability to give sound, accurate advice on how to secure satisfactory remedies. It is not much help to the restaurant owner or to the cause of better sanitation to point out that the contact time for dish sterilization is too short, unless effective means for correcting this defect are readily available.

The development of the control of environmental sanitation involves a bacteriological study of methods that will destroy causative organisms and the engineering design of equipment which will assure the necessary bacterial control. This sequence has been repeated numerous times in the past with proven results. Most of us recall the developments in improving milk sanitation following the application of more rigid sanitary engineering design to milk processing equipment. From the standpoint of the public health administrator, there is at this time a pressing need for the development of better designed equipment and a more practical application of positive control methods for many features of restaurant sanitation. If, as we are told by the bacteriologist, it is essential for health protection that certain foods be kept below a determined maximum temperature, or that utensils be subjected to specified methods of disinfection, then these requirements are a logical part of modern restaurant sanitation programs. However, at the present time the objectives of many of these requirements are not being attained and will not be until sanitary engineers greatly improve design features of kitchens and restaurant equipment, and develop practical and more dependable control methods. Obviously, a health official is in a difficult position when an ordinance requires methods or results beyond practical attainment. A few examples from experience actually encountered in the field will illustrate.

Frequently we have been asked to give the size of a kitchen necessary to handle a specified load, and state how

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we would recommend arrangement of equipment in the kitchen and location of various operations. When a kitchen has been properly criticised on account of its size or the arrangement of its contents, it is not unreasonable for the owner to expect reliable recommendations for securing necessary corrections. It would seem not only desirable but practical to develop typical floor plans and minimum areas for kitchens, adequate cabinet space for storage of eating utensils and table area, based on, for example, the estimated meals to be served per day. Such data should also include recommendations concerning proper plumbing installations since many installations of unsafe plumbing have been noted in restaurants. Rat proofing of restaurants is highly desirable for economic as well as sanitary reasons, and standard methods and specifications for securing this should be made available by health departments.

The problem of adequate refrigeration space and the need for being able to make specific recommendations are critical from the health standpoint. According to the U. S. Public Health Service, 37 per cent of the food epidemics in 1942 were due to faulty refrigeration. Inadequate refrigeration is one of the most common defects found in eating establishments, and it is aggravated during warm weather because of increased quantities of food and dishes that require refrigeration. The experienced restaurant owner seldom knows, and we have failed to find reliable information showing what a reasonable figure for icebox capacity based on the meals served per day should be. It is not only a question of having sufficient room to store food that must be refrigerated, but also that of the proper cooling of food stored within the refrigerator when it is loaded to excess.

The type of refrigeration and its location and design for most convenient use are well worth more careful consideration. A partially completed study of this engineering problem would tentatively indicate that an icebox capacity of 0.15 to 0.25 cu. ft. per meal served per day is approximately correct to prevent overloading. This also raises the question of icebox temperatures which are usually found very close to 50° F. and too frequently higher than that. The importance of adequate refrigeration would indicate the necessity of engineers devising a suitable temperature recording and control device for the icebox similar to that used on milk pasteurization vats, in addition to suitably placed indicating thermometers.

Dish and utensil washing and particularly sterilization offers an exceptionally fertile field for better control and operation by the application of improved engineering design. This problem, particularly mechanical dishwashing, has been given careful and very constructive thought by a committee of this organization. However, to a very large degree, recommendations have not yet been applied to machine design. Time and temperature or chemical concentration are of course the factors responsible for producing satisfactory utensil sterilization. However, as those in restaurant sanitation work too well know, temperature is seldom adequately maintained, and time and chemical concentration are almost never accurately controlled. Many mechanical features of dishwashers need improvement in design and construction. The location of thermometers is frequently unsatisfactory; details of design that would greatly aid cleaning are lacking; easy disassembly and assembly for repair and cleaning is usually overlooked; the optimum volume and pressure of wash and rinse water have probably not received the attention warranted either in design or operation; and detergent dis-

pensing by mechanical automatic means leaves much to be accomplished.

We have encountered a number of instances where a restaurant owner was put to considerable extra expense due to lack of adequate engineering information concerning hot water capacity necessary for operating dishwashing equipment. In one instance, the original installation proved to be only half the capacity finally needed as determined by trial-and-error method. There are available various methods for supplying hot water, but in every case capacity is a major consideration. A hot water supply of one restaurant was secured from the central water heater which supplied hot water for the entire building. This presented a problem because of the difference in temperature required for normal purposes and for sterilizing dishes, a consideration overlooked in the original design and installation. Probably the most universal example of inadequately designed sanitary equipment for washing and sterilizing dishes occurs at the numerous and popular soda fountains. Undoubtedly lack of space and need for emphasizing appearances makes this a difficult problem, but certainly it is not insurmountable. However, it is most essential that the manufacturers of fountain equipment be persuaded to develop satisfactory design that will fit into and meet the restrictions of the complete fountain set-up.

When manual methods of dishwashing are used, the efficiency must be viewed with great skepticism, since the control is in the hands of the poorest type of help and the time element for securing disinfection is largely an indirect ratio to the number of dishes to be washed. In many cases the solution to this may involve the rather simple determination of the minimum number of dishes necessary to handle a maximum load satisfactorily with given dishwashing facilities. There are many instances where manual dishwashing and disinfection is the only practical procedure and certainly it is vitally important that better designed methods be developed.

There are several other neglected design features that to greater or less degree affect restaurant sanitation. The most important ones are: really effective ventilation of the kitchen; materials used in construction of utensils and equipment; design of slicers and grinders, so that cleaning is easy and effective; satisfactorily planned and executed garbage disposal. Steam tables are widely used but the effect on food stored for many hours at desirable temperatures, which probably meet incubation requirements of certain bacteria, and the sanitary significance of this practice have never been investigated as far as I know.

These are some of the most important environmental factors in restaurant sanitation that lend themselves to better sanitary engineering design and control. Further, the application of proven sanitary engineering principles more completely to restaurant sanitation appears to be feasible based on past performances in other fields. The design capacity and performance rates of various units that make up a water treatment plant or milk pasteurization plant have been sufficiently developed that a well balanced design is feasible based on known demands. Within reasonably narrow limits the maximum capacity of a given restaurant expressed in number of persons or of meals served in a given time is determinable. With this figure established, all necessary facilities such as refrigeration space, dishwashing capacity, number of dishes and utensils required, etc., can be estimated, and we should within reasonable limits be able to present more exactly the essentials for good restaurant sanitation. Such an approach will not only assure added safety and better

control of food epidemics but also provide a necessary service to the industry that should add greatly to the support and acceptance of the health official's program by restaurant management.

To bring about the universal use of the essentials necessary for good restaurant sanitation warrants consideration to the following recommendations: (1) the development of satisfactory standards for all phases of restaurant sanitation; (2) logically at the federal level, that an effort be made to bring all manufacturers of restaurant equipment to agree to the incorporation of proved essential sanitary design into their equipment; (3) that serious consideration be given by local enforcement officials to some procedure whereby plans for restaurants and food handling equipment be submitted for review and approval by the official agency before construction is begun or a purchase made.

With a growing interest and demand for better restaurant sanitation it is high time the sanitary engineer accept the obligation as well as the opportunity that has been too long neglected in this field of environmental sanitation. The application of sanitary engineering technique to this problem has been in the past and is today prominent by its absence. Here lies an undeveloped field almost entirely engineering in nature that is crying for attention and effective study as a solution to a number of important sanitary problems.

ACKNOWLEDGMENT is gratefully made to all those concerned with restaurant sanitation in Missouri for their contribution to the problems discussed in this paper; particularly R. W. Hart of the U. S. Public Health Service; Leonard Board, St. Louis County Health Unit; and Percy Johnson, until recently with the State Board of Health, now with New York University; and to our Secretary, John Hepler.

Industrial Medical Examinations in South Carolina

According to the *Industrial Hygiene News Letter* of the U. S. Public Health Service, a mass movement toward physical examination of employees in the textile mills of South Carolina has resulted from efforts made by the Division of Industrial Health of the State Board of Health to educate manufacturers in the advantages of an active health program.

Nurses of the Division carried the message from one mill to another. Leading mills, with personnel services including good health programs, were having so much less trouble securing and keeping capable workers that less progressive mills became convinced of the competitive advantages to be obtained from placement based upon preemployment examinations and periodic follow-up examinations. The improved economic position of the textile mills at the present time is making rapid development in this direction possible.

Sanitary Aspects of the Control of the 1943-1944 Epidemic of Dengue Fever in Honolulu*

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DENGUE fever again made its appearance in epidemic form in Honolulu, Territory of Hawaii, in 1943, after an absence of over thirty years. The first two recognized local cases were reported to the Board of Health as having had an onset on July 24, 1943. It is probable that the disease was imported from the Southwest Pacific. This supposition is primarily based on the knowledge of the cases of two airlines pilots who were hospitalized with dengue in Honolulu earlier in July after arrival from Suva, Fiji Islands, where an epidemic of dengue had been reported. One of the pilots was already ill when he came to Honolulu, but the other had onset of symptoms several days later and was not isolated by hospitalization until he had passed through the infectious period.[1]

Earlier dengue outbreaks in Hawaii occurred in 1903 and 1912.[2-4] In 1893, an outbreak of disease occurred, known to the natives as "Boo-hoo fever," which had dengue-like symptoms.[2] Judging by the reports of government physicians and other available information, the 1903 epidemic was severe, affecting a large portion of the Territory's population. Records of the 1912 outbreak are incomplete and, though it appears that this epidemic was milder, doctors and older residents state that only a fraction of the cases were recorded.

Dengue fever is an acute virus infection, endemic in most tropical and subtropical areas. It invades temperate zones in the form of explosive, widespread epidemics. The disease has an incubation period of 4 to 15 days[5] and is characterized by sudden onset with high fever, severe headache, backache, and post-orbital pain. In Honolulu the "saddle-back" temperature curve and terminal macular-papular rash were often, though not always, observed. The average duration of illness was 10.5 days.

The vectors of dengue fever in the Hawaiian Islands are: *Aedes aegypti* (Linneaus) which breeds in artificial containers such as bottles, tin cans, flower vases, and tanks; and *Aedes albopictus* (Skuse), which breeds in artificial containers and in natural containers such as tree and rock holes and water-holding plants.[6]

Most dengue epidemics have spread so fast and become so widespread that little or nothing could be done to control them. Usually they have been stopped by the first frost or by depletion of the non-immune population. In the past it has been almost impossible

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to get an accurate record of the number of cases. From the standpoint of public health, the Honolulu dengue epidemic is unusual in the following respects:

1. It is believed to be one of few outbreaks of such proportions to be suppressed largely by mosquito control.
2. Almost all of the cases which occurred were reported to the Board of Health.
3. Every reported case received at least one epidemiological visit.

FIRST INFECTION IN WAIKIKI DISTRICT

That portion of Honolulu situated along the Waikiki Beach became the first focus of infection of the 1943–1944 epidemic. Many cases appeared among employees of the inn where one of the airlines pilots had stayed prior to being hospitalized. By August 8, dengue had spread sufficiently to cause military authorities to declare Waikiki "off-limits" for troops.

The Territorial Board of Health took immediate action to control the epidemic. Nine inspectors of the Rat and Mosquito Control Squad of the Chamber of Commerce were then available and were soon supplemented by 24 new men employed with Chamber of Commerce funds. Five soldiers were also assigned by the army because of the military importance of the work. These men worked as a crew, covering Waikiki, and later the city, section by section. They made routine exterior premise inspections, eliminated mosquito breeding and suggested corrective measures to householders.

In addition to these efforts, an educational campaign was carried on by the Board of Health. Newspaper articles were released daily and radio time was given for the discussion of the dangers of a widespread epidemic. Printed instructions were distributed by the Office of Civilian Defense wardens requesting householders to spray with insecticide and eliminate all water-holding containers.

In spite of these precautions dengue increased, especially in the Waikiki area. The danger of an explosive epidemic was obvious to public health and military authorities in this critical war area. The effect of thousands of cases of dengue among military personnel and the war-connected civilian population in the principal base of the Pacific Ocean might have been disastrous. During the latter part of August all premises in the Waikiki area were sprayed with insecticide at the suggestion of Brigadier General Edgar A. King, Surgeon, Central Pacific Area, U. S. Army, utilizing high-pressure Chemical Warfare Service decontamination truck sprayers. Upon request for assistance, the U. S. Public Health Service assigned an engineer and an entomologist to the Board of Health about September 1, to assist in organizing a control program.

CITY-WIDE CONTROL PROGRAM

By September 1, 148 cases had been reported, many scattered throughout Honolulu, thereby ending all hope of confining the epidemic to the Waikiki district and making it essential to inaugurate city-wide Aedes mosquito control at once. Due to critical war construction activities, recruitment of civilian employees was very difficult but 13 men were hired in two weeks, and these, added to the previous squad, together with 50 soldiers assigned by the army, gave a total staff of 96, which began work on September 15.

Each man was equipped with an identifying armband and a kit which consisted of: kerosene, Paris green and phenothiazine larvicides; mirror and flashlight for inspecting containers; chalk for marking arrows on sidewalks to guide his foreman; pencils and record sheets; "Notice to Householder" forms; educational pamphlets; and a pipette and vials for collecting larval samples.

Honolulu was divided into 3 districts and subdivided into 77 inspection zones, each zone of such size that one man could inspect every premise, interior and exterior, on a 10 day cycle. The inspectors were grouped into crews, averaging 6 men, and a foreman was placed in charge of each crew. A supervisor was assigned to each district in charge of four crews.

METHOD OF OPERATION

Each morning the foremen transported their crew members to the point in their zones where they had stopped work the previous day. Thence, the inspectors proceeded on foot from premise to premise. They contacted the householders whenever possible to state the purpose of the inspection and to instruct them to eliminate mosquito breeding places found on their premises. Written notices were left when no one was at home. Definite action was taken on every mosquito breeding place. The inspectors made all possible corrections by inverting containers or treating them with larvicide. Difficult problems were referred by the inspector to his foreman who either eliminated the trouble or forwarded the matter to headquarters for action by a special activities crew. Every inspector was trained to differentiate between Aedes and Culex larvae. Records of inspection findings were made in order to compute mosquito breeding indexes. Official abatement orders were issued by headquarters to chronic violators.

Aedes mosquitoes were found breeding in all sizes and types of containers. All of the usual varieties of receptacles found in continental United States were observed in Honolulu. The new problems encountered were due principally to the sub-tropical vegetation which abounds in parts of Honolulu. This includes plants having cups which can hold as much as one-half pint of water, such as spider lilies, pineapple lillies, and ape plants (also called Samoan taro); rotted-out holes and crotches in poinciana, algarroba, haole koa (a small Acacia) and guava trees; bamboo and banana stumps; and the large water pockets in traveller's palms. Other unusual breeding places were found in fallen palm fronds, air raid shelters, and in the holes of lava-formed rocks and pockets in emerged coral reef formations. In over a million premise inspections Aedes mosquitoes were found breeding only four times in ground pools with earth sides.

The effective flight range of *Aedes aegypti* has long been known to be about 75 to 150 yards. Observations on *Aedes albopictus* indicate that the flight range is probably not much greater than that of *aegypti*. Therefore, the control zones extended only to the fringes of the inhabited area.

EPIDEMIOLOGICAL RECORDS UTILIZED

Maximum use was made of the epidemiological findings. Confirmed and suspected cases of dengue were reported daily from the Bureau of Communicable Diseases and a crew of "trouble shooters" was dispatched to spray and inspect the premises on which cases had occurred and other premises in the neighborhood immediately surrounding them. It was found that less than 60 per cent of the cases were reported within 3 days after onset of symptoms. This was due to delay in calling physicians, difficulties of diagnosis, and slow reporting. The average period of infectivity of a dengue patient is from the day before onset to 3 or 4 days afterwards.[7] Therefore, although a public health nurse visited each patient to set up a bed net to prevent the infection of additional mosquitoes, the effectiveness of this activity was limited by the lag in reporting. A mosquito becomes infective 8 to 11 days after biting an infectious patient and remains infective for life.[5, 7] Thus the destruc-

tion of adult mosquitoes was of primary importance.

The "trouble shooters" used self-contained pressure hand sprayers for interior spraying with kerosene-diluted 2 per cent pyrethrum extract as the active agent, and liquefied gas as the carrier and propulsive agent. These sprayers produce a dry, fog-like spray. Windows and doors of buildings were closed for at least five minutes during and after spraying. The sprayer nozzles were removed to obtain a powerful, far-reaching spray to treat the undersides of residences which were open to mosquitoes. The source of infection and places of contact during the period of infectivity of the patient, if obtainable from the case history, were also sprayed.

SECOND FOCUS IN KAKAAKO AREA

As would be expected, a time lag occurred between inauguration of expanded control activities and the first noticeable decrease in the number of new cases reported each week. During this interim the second major focus of infection developed in the congested Kakaako section located adjacent to the business district near the center of the city. The initial point appears to have been in a large business plant, employing about 300 persons, which failed to carry out spraying activities as had been requested. The situation reached a climax when over 70 employees were ill with dengue at one time and the plant was requested to shut down for a half-day while a portable engine-driven power sprayer was brought in to kill adult mosquitoes. Many cases, residing in the Kakaako district and elsewhere in Honolulu, were traced to this spot.

After the spraying of the initial focus in Waikiki, a definite decrease could be observed in the number of cases occurring in that area. It seemed likely that the sharp reduction was due more to the destruction of adult mosquitoes by spraying than to the recently inaugurated larval control phase of the program. Waikiki was sprayed with undiluted commercial fly spray at a cost of about $3,000. The insecticide burned some foliage in the gardens but the results justified the means. Pyrethrum extract was available for spraying the Kakaako district and an emulsified spray was made from a stock solution which consisted of equal parts of kerosene and 2 per cent pyrethrum extract with a small amount of wetting agent added (1 lb. of vatsol per 400 gal. of spray). When used, the stock solution was diluted at the rate of 3 parts to 100 of water. The spray rigs were truck-mounted and operated at a pressure of 400 lb./sq. in. with two spray guns in use. Both standard army spray guns and tommy-gun sprayers with 1/32 in. orifices, were utilized with excellent results. Each truck crew covered about 85 premises per day. A satisfactory lethal effect on mosquitoes was obtained without injury to plants.

The spraying technique consisted of fogging the atmosphere with the spray, working from premise to premise, making certain to direct the spray into porches, under buildings, beneath eaves, into outbuildings, under debris and into shrubbery. Estimating the average effective height of the spray as 10 ft., the amount of pyrethrin applied is calculated to be about 0.231 gm./1,000 cu. ft. This provides a wide margin of safety over pyrethrin requirements for a closed air space and allows for the dilution caused by air currents and the shorter period of contact.

Simultaneously with the exterior power spraying in Kakaako, interior spraying was done by a crew equipped with hand sprayers. This was considered important because a majority of the buildings were not screened and many mosquitoes would otherwise have

opportunity to escape. Caged mosquitoes have lived as long as 73 days in Honolulu, and therefore every effort was made to destroy all mosquitoes in the areas of high dengue incidence.

When the Kakaako district was sprayed at the end of the first week of October, the daily total of new cases in Kakaako had already surpassed that of the Waikiki outbreak. At the same time a third focus of infection was discovered—the Buckle Lane-River Street area, another congested, slum-like district not far from the middle of the city. The spray crews were moved to this new focus after Kakaako was completed and before it had developed into a serious problem. Both the Kakaako and Buckle Lane-River Street areas were restricted to military personnel on October 23. Another section, near the extreme northwest end of Honolulu, was placed on the restricted list when a few cases appeared there but it never reached the proportions of a serious problem.

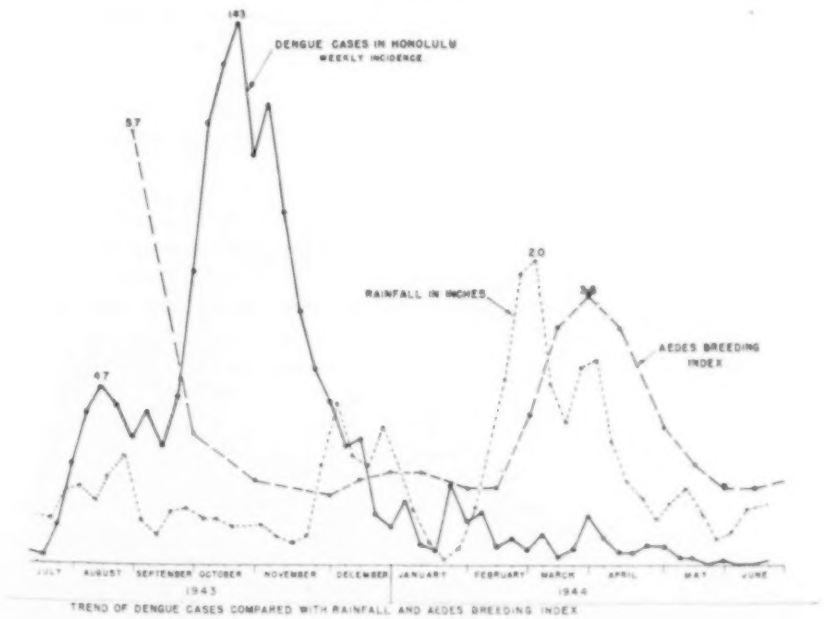
Other minor foci developed and these, together with large numbers of scattered cases, brought the total to 851 reported by the end of October. The peak of the epidemic was in the third calendar week in October, when 143 reported persons became ill. After that the epidemic curve fell at about the same rate it had risen, reflecting the general reduction in mosquito population. Near the end of December, it began to level off at about 10 new cases per week (Figure 1). Military authorities lifted all restrictions on December 30

When the foci of infection became smaller, a portable gasoline engine-driven sprayer with 3 gal./min. capacity was utilized with good results. The same spray mixture was used as in the decontamination truck sprayers.

RESULTS OF SPRAYING ANALYZED

So far as is known, the technique of comprehensive spraying with power equipment for control of dengue fever

FIGURE 1



TREND OF DENGUE CASES COMPARED WITH RAINFALL AND AEDES BREEDING INDEX

FIGURE 2

is unique. The need for such a massive attack has been described. In order to analyze the results, graphs are presented showing the rise of dengue incidence in three of these areas and the sharp decrease following the spraying operation. Since the maximum incubation period observed during the epidemic was 14½ days, it is logical to expect a decreasing incidence when that period has elapsed after the spray treatment. In the Waikiki and Kakaako areas (Figures 2 and 3) the break came at 13 and 15 days, respectively, while in Buckle Lane-River Street (Figure 4), the period was 6 days. In the latter two foci, additional areas were sprayed shortly after the initial coverage, when it was discovered that cases were appearing outside the delineated zones. Following this, a further sharp decrease in transmission occurred. The sprayed area in Waikiki was equivalent to 125 square blocks; Kakaako, 85 blocks; and Buckle Lane-River Street, 17 blocks. Five smaller foci of infection were attacked by spraying (McKinley High School, Hikina Lane, Pohaku Street, Iolani School-Judd Street and Kaluwahine Homesteads). In two instances it was necessary to respray small portions when infection reëntered the areas months later. From the standpoint of controlling an epidemic in its incipient stages or later when it is in the process of spreading from zones of high incidence, comprehensive spraying is manifestly a valuable technique.

Special control activities included a vigorous clean-up campaign sponsored by the Chamber of Commerce. After this was completed it was yet necessary to set up a clean-up crew of about

FIGURE 3

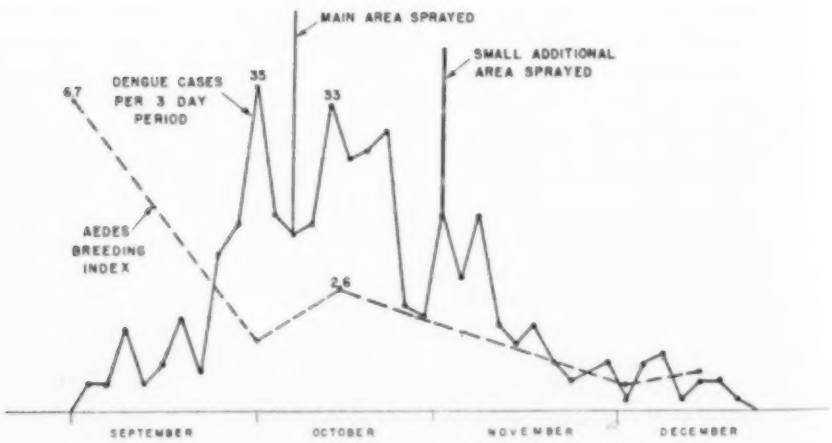
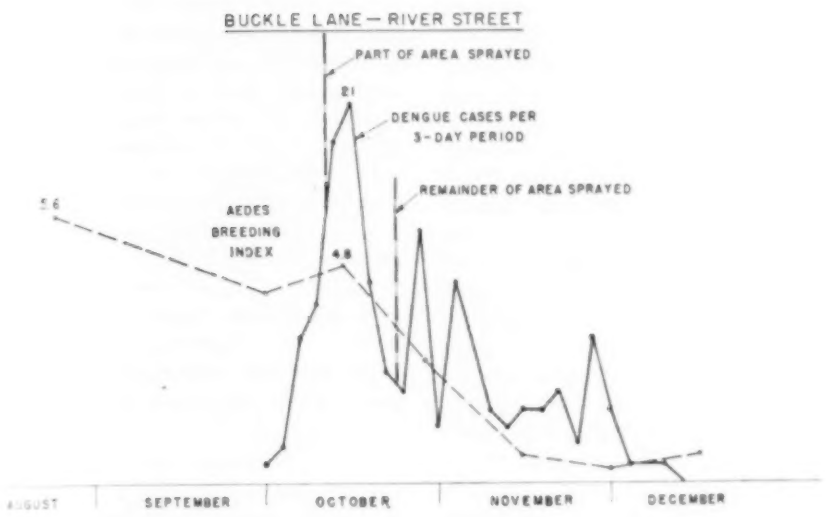


FIGURE 4



30 men, who collected and hauled away about 3,600 truck loads of tin cans, bottles, and other receptacles. Catch basins, storm drains, and utility company manholes were oiled by a motorcycle-mounted pressure tank spray unit. Roof gutters were removed, perforated or cleaned by a two man crew. Mosquito fish, *Gambusia affinis,* were stocked in places where they would propagate. Tree and rock holes proved very troublesome during rainy weather, and a small crew filled over 10,000 tree holes and 8,000 rock holes with cement. The tropical garden plants were among the most numerous breeding places in some areas and whole beds of lily and ape plants were removed by the owners, or, upon request, by the crews. All special crews were under direct supervision of headquarters.

DESIRED GOAL CITED

Briefly, the goal of the dengue epidemic control program in Honolulu was to reduce Aedes mosquito breeding throughout the city by every possible means, and at the same time to follow up all individual and group dengue infections by spraying to kill adult mosquitoes.

Very early in the program the danger of spreading the disease from Oahu to the outside islands was realized. Most inter-island travel is by plane. Inspections were conducted around the airports, and the technique of disinsectization of airplanes was reviewed and suggestions were made. Pyrethrum bombs were obtained from the army and loaned to the inter-island airlines for more effective spraying of planes. A printed notice was given to each inter-island passenger requesting that, after arrival on an outside island, any suspicious illness be reported to the local health authorities. A few cases of dengue contracted in Honolulu, which is on the Island of Oahu, did develop on three other islands, but prompt follow-up by spraying and other control measures instituted by the local health officers and military officials prevented the disease from gaining a foothold.

PUBLIC EDUCATION

Educational activities were vital to the successful operation of the program. Every available means of reaching the public was utilized. A special student survey was conducted through the Director of Health Education of the public schools. Over 25,000 separate inspections were made by students in their own homes where they found 30,000 water-holding containers and eliminated 5,000 which contained mosquito wrigglers. Radio spot announcements were presented and radio time was given by the President of the Board of Health in his weekly broadcast. Newspapers daily carried front-page accounts of the progress of the epidemic and methods of controlling its spread. Business houses throughout the city incorporated dengue publicity in their advertisements. Since some of the population come from foreign lands, publicity was issued in the Japanese, Chinese, Filipino, and Korean languages. A two minute sound movie trailer, prepared through the coöperation of the Army Signal Corps and the Navy photographic laboratory, was shown in 60 theaters in the Territory of Hawaii. With Chamber of Commerce funds, posters were exhibited in store windows, cards were placed in buses, and stuffers were placed in laundry bundles, and in bills of public utility companies. The Governor's "Work to Win" Committee arranged for publicity pictures, exhibits, and newspaper statements by local community leaders.

MOSQUITO BREEDING INDEXES

In order to guide the control program intelligently a comprehensive set of records was maintained from its start. The Aedes breeding index was used as a standard. This is the per cent of premises found with Aedes breeding places. Zone and city-wide indexes were calculated daily for the first few weeks and for each semi-monthly period thereafter. In addition, indexes were computed for the various classifications of containers by type. Graphs were used to show the relative hazard in the various zones and in the different types of containers, so that control efforts could be placed properly or revised when necessary.

For future guidance it is important to know the threshold of sanitary importance; that is, the index below which extensive dengue transmission will not occur. In Honolulu, the city-wide Aedes breeding indexes were as follows, omitting the mid-month figures:

1943	Per cent	1944	Per cent
August 31	5.7	January 31	1.0
September 30	1.7	February 29	1.9
October 31	1.1	March 31	3.5
November 30	0.9	April 30	1.8
December 31	1.2	May 31	1.0
		June 30	1.1
		July 31	0.7
		August 31	0.8

Since the accuracy of these indexes is dependent on the experience of the inspectors, it is assumed that the actual breeding was higher than recorded at the beginning, with the accuracy gradually increasing. A spot-check made by experienced men early in September indicated that the city-wide index would be less than 10 per cent.[6] Soper and Wilson have stated that with yellow fever the threshold of sanitary importance or "critical index," is about 5 per cent of premises breeding *aegypti*.[8] It is believed that sometimes a lower index must be sought to prevent dengue, probably about 3 per cent where other conditions are favorable for transmission. Hanson even goes farther when he states ". . . the control of dengue requires a reduction of the *aegypti* incidence to a relative zero . . ." based on the short period of immunity conferred by dengue.[9]

In an epidemic characterized by a number of succeeding foci of infection it is necessary to study the situation in

these areas separately. Mosquito breeding indexes up to at least a month previous to the beginning of any focus of infection must be considered because of the longevity of the adult insects. Figures 2, 3, and 4 show that the Aedes breeding indexes preceding these foci were probably not much above 5 per cent, even allowing for inaccuracy due to inexperienced inspectors.

POPULATION AND ENVIRONMENTAL FACTORS

The foci of infection all have at least one factor in common: high population density. The first three, Waikiki, Kakaako, and Buckle Lane-River Street have great numbers of closely-packed one and two story residences, many occupied by more than one family. In the latter two, particularly, screening of houses is almost entirely lacking. The short flight range of the vectors emphasizes the importance of the environmental situation. These factors, coupled with a moderate Aedes breeding index, provided suitable conditions for fast-spreading, localized outbreaks.

Conversely, there were other districts with one or more of these factors lacking, which, though seeded with dengue cases, never developed into areas of high incidence. Included were zones of extremely high population density and poor screening but with Aedes indexes from 2.7 per cent downward; also zones with moderate to high Aedes indexes, but with well spaced, adequately screened homes. Honolulu is a city with a tremendous range of rainfall—from about 23 inches annually along the beach and waterfront to almost 100 inches at the heads of finger-like valleys extending back between the mountain ridges. Fortunately for the dengue control work, the congested, poorly screened districts are not located in the moist, mosquito-ridden valleys.

Both *aegypti* and *albopictus* were undoubtedly implicated in the transmission of dengue, but, interestingly, it was observed that the infestation of *aegypti* was relatively greater in several of the epidemic foci than throughout the city as a whole. This is suggestive but not conclusive evidence that *aegypti* is a better vector of dengue because these areas afforded more suitable breeding places for *aegypti* than for *albopictus*. On the other hand, dengue spread to all eight members of an Hawaiian family residing in an isolated valley, which was *aegypti*-free, but infested with *albopictus*. At the start of the program, *albopictus* was about three times as abundant as *aegypti*, but due to the preference of *aegypti* for artificial containers such as tin cans and bottles, a differential reduction by the control activities was observed. During the rainy season, when heavy *albopictus* breeding was found in tree and rock holes and in plants, this forest loving species appeared with six times the frequency of the domesticated *aegypti*. By June, 1944, the ratio was 30 to 1. *Aegypti* in Honolulu thrives best in the warmer coastal sections of the city.

INFLUENCE OF RAINFALL

After the peak of the Honolulu epidemic was passed, there was no direct correlation between the curve of mosquito breeding indexes and the curve of the dengue cases, though mosquito breeding was shown to follow rainfall. The trend of the decreasing index was interrupted in early December when increased rainfall caused a slight rise which was later corrected. When the annual rainy season developed (though late) in February and March, the mosquito index more than tripled in one month. As rainfall again dropped to normal the mosquito breeding was immediately reduced. Neither of these increases in mosquito breeding produced a subsequent flare-up in the

epidemic. This was to be expected because the locating of the increased number of breeding places also meant the destruction of the larvae. Therefore only the "missed" breeders produced adult mosquitoes under any circumstance.

From the beginning of the epidemic up to June 30, a total of 1,498 dengue cases in civilians occurred, less than 0.7 per cent of the population of Honolulu. Relatively few cases were reported among military personnel. The peak of the epidemic in the third week in October was reached 14 weeks after the occurrence of the first recognized cases. From this peak 9 weeks elapsed until the curve began to level off. Since then there has been a slow decrease to an average of 5 cases per month. Meanwhile, new dengue cases have been imported intermittently from forward combat zones. It has not been possible to trace locally acquired dengue to "off shipping" cases, but the threat of a flare-up necessitates continued efforts to maintain a low Aedes mosquito population.

It was felt at the start that the first objective of the program should be the prevention of a crippling outbreak which might seriously hinder military operations in the Pacific theater of war. This objective has been accomplished. The next step is to eliminate dengue completely and this is proving to be a slow job. The most numerous vector, *Aedes albopictus* (Skuse), breeds throughout the dense forests up to 2,000 ft., so species eradication is not practicable.[6] However, mosquito incidence has been reduced to a satisfactory level by application of the techniques and efforts described.

SUMMARY

Sanitary controls used in the epidemic of dengue fever in Honolulu were (1) city-wide premise-to-premise inspections on a 10 day cycle to reduce general incidence of the vectors, *Aedes aegypti* (Linneas) and *Aedes albopictus* (Skuse), (2) comprehensive exterior-interior spraying to eliminate foci of dengue infection, and (3) public education to urge householders to prevent mosquito breeding on their premises.

Aedes breeding indexes were satisfactorily reduced by the inspection-correction-education efforts while simultaneous spray work destroyed adult mosquitoes in zones of high dengue incidence. The "critical index" or threshold of sanitary importance with dengue appeared to be lower than the safe point for yellow fever—5 per cent. Comprehensive spray treatment of the epidemic foci was followed by a sharp reduction in cases. A total of 1,498 civilian cases occurred from July, 1943, through June, 1944, or less than 0.7 per cent of the population.

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THE CHALLENGE OF MALARIA CONTROL

PROFESSOR T. M. Drown, pioneer of sanitary chemistry in the United States, was fond of pointing out that "the time of change is the time of danger." He was thinking of the menace to potable waters which developed at the time of fall rains and spring thaws. The axiom, however, holds over much wider areas of public health. When large numbers of people pass from one country to another and back again, there is change and there is danger. Millions of American soldiers and sailors are operating, or will operate, in Central Africa and in the South West Pacific which include the most fever-ridden areas on the surface of the globe. We already have warning signals of the results which we may expect. In the New England, Middle Atlantic, East North Central, and West North Central States there were reported during the winter months of January, February, and March, 1940, 101 cases of malaria. During the corresponding months of 1944, there were reported from these same states, 611 cases of malaria. The increase of 500 per cent is undoubtedly due to relapses among returned servicemen. It is a storm warning to which we should give heed.

This problem was forcibly presented at the meeting of the State and Territorial Health Officers last fall by Dr. L. L. Williams and his colleagues in the U. S. Public Health Service. M. D. Hollis described the program carried out by the organization called Malaria Control in War Areas for the protection of military establishments in 38 states, the District of Columbia, Puerto Rico, and Jamaica, covering 1,600 individual projects, at a cost of some $10,000,000 a year. Dr. Williams stressed the need that will develop in the future for protecting the general population from the servicemen who will return to their home communities as carriers of even more virulent strains of plasmodia than those with which we have been familiar in the United States. He pointed out that "having never restricted civilian carriers (of malaria), it is neither humanitarian nor possible to restrict the movements of restless military carriers and that, therefore, we must concentrate our efforts against the vector mosquito." As Surgeon General Parran pointed out at our A.P.H.A. meeting in 1943, the answer is to be found, not in quarantine, but in rendering the local environment non-infectible.

It would be needlessly alarmist to anticipate serious difficulty from the introduction of new and sinister "tropical diseases." It is true that filariasis was introduced at Charleston, S. C., but only by a large group of infected slaves, and it has now probably died out. Since the parasite does not appear in the blood for 18 months, and since it is frequently fatal to the insect vector, the task of this parasite is an arduous one. It is good old-fashioned malaria, not any exotic malady, that we must expect. And the chief source of danger will not be the known clinical case developing during service, since such a case will have had long and intensive treatment. The major menace is the man who has been kept well under repressive treatment, but who harbors the parasite and may, when treatment ceases, suffer a relapse. Such men may run into tens or hundreds of thousands by the time demobilization is completed.

The past history of malaria control in the United States has been a creditable one. Malaria in the days of the first settlements was a deadly scourge clear up to the Canadian border. In the North it has disappeared as a result of agricultural drainage and better housing. In the South, in spite of the longer breeding season of the mosquito, much progress has been made. The malaria control work of federal, state, and local health departments in thickly settled areas, the thousands of miles of ditches dug by relief workers during the depression, the campaign for elimination of anopheline breeding places near military camps and war industries, have accomplished notable results. A survey carried out by the Malaria Control in War Areas staff (using the thick film method) showed 0.5 per cent infection instead of 6.0 per cent found ten years ago. Since the cyclic rise in malaria rates of 1934, there has been no measurable peak in the civilian incidence of this disease.

Yet the job is not completed. Dr. O. G. Gilliam reports that the U. S. Public Health Service, after an intensive study, has found portions of 68 counties in the southern states which still constitute major danger spots. The seven year cycle of peak malaria prevalence which prevailed prior to 1934 shows how incidence may build up if constant control is not maintained. We have had experience of malaria epidemics in Camden, N. J., in Aurora, Ohio, in Paw Paw, Mich., and in a narrow belt of country extending through 5 states from the upper Mississippi. The infection from Army and Navy carriers will inevitably upset the balance of the situation and cause serious trouble in many southern, and some northern communities—unless we bestir ourselves.

It is for this reason that the U. S. Public Health Service is urging a comprehensive, nationally planned, program of malaria control based on three procedures:

1. Intensive control of the insect vector in existing foci of malaria. This should include not only the control of present larval breeding places and of new breeding places created by power and flood control impoundment; but also the protection of dwellings against adult mosquitoes by the use of the new insecticides now available.

2. The organization of mobile teams to institute control measures in case of outbreaks of malaria in marginal or northern states.

3. Education of physicians, through refresher courses and in other ways, in the prompt recognition of a disease with which many of those in civilian practice are today not familiar.

Dr. Williams estimates that an adequate program might cost between 10 and 15 million dollars a year for at least five years and a million dollars a year thereafter to maintain inspection and educational work. Such a program would be well worth the cost.

THE WIDE SIGNIFICANCE OF NUTRITIONAL DEFICIENCY

PUBLIC health workers are watching with keen interest the new evidence which is presented, year by year and month by month, in regard to the influence of diet upon health. Not all this evidence points in one direction. In studies with human beings on the effect of supplementing ordinary diets—some with minor, other with more pronounced deficiencies—results have not always been uniform. There are, however, many pitfalls in such investigations which have recently been reviewed by the Committee on Diagnosis and Pathology of Nutritional Deficiencies of the N.R.C.[1]

On the whole, the mass of positive findings, which indicate the major importance of this problem, is impressive. An appraisal of the evidence has recently appeared in *Bulletin No. 109* of the National Research Council.[2] More recently, a symposium on the subject at the Twenty-Second Annual Conference of the Milbank Memorial Fund has brought out the marked progress in this field and the great importance which may be attached to it.[3]

In the first of six articles in this symposium, F. F. Tisdall emphasizes the fact that not markedly but slightly or moderately deficient diets—not classical and florid but less intense, long standing deficiency states—constitute the public health problem of nutrition in this country. He cites examples of demonstrations that these conditions interfere with attainment of full physique, performance, and health, and that improvement in diet and nutrition brings corresponding betterment in these respects.

The beneficial influence of satisfactory nutrition on growth begins in the womb. The causes of many complications during pregnancy and of difficult labor have long been obscure. As for the condition of the infant, it has been sometimes maintained that under conditions of nutritional adversity the expectant mother suffers all the untoward effects while the fetus is protected. Yet no less than ten studies bearing on the relation of nutrition to pregnancy have yielded results indicating the benefits for both mother and child of improved nutrition. Reporting on one of the latest and completest of such studies, Bertha S. Burke has submitted evidence that puts the matter beyond peradventure. A relationship was found between the expectant mother's dietary habits and the course of her pregnancy and parturition, particularly the incidence of toxemia and difficult types of delivery. Also the dietary practice of the expectant mother during pregnancy was directly related to the condition of the infant at birth and within the first two weeks of life. Thus, not only the expectant mother's course in gestation and labor, but also the health of the child is dependent on nutrition during pregnancy. This principle is ready for application in prenatal programs, both for improving the course of pregnancy and labor and for further lowering infant morbidity and mortality rates.

In another article in the symposium Josef Warkany records that with experimental animals he has repeatedly induced by faulty diets developmental defects of a type often attributed to genetic causes. Such abnormalities as syndactylism, brachydactylism, and cleft palate occurred when the maternal diet was deficient in riboflavin; changes appeared in the ribs when vitamin D was inadequate. Even more recently, developmental defects have been reported as appearing in the eyes of the young when the maternal diet is low in vitamin A.[4] Thus, certain ana-

tomical abnormalities developed *in utero* are directly related to maternal malnutrition.

As life goes on, the status of nutrition continues to exert a vital influence on growth and development and efficiency. Learning ability is one of the qualities directly affected by nutritional status. Nutrition, in its demonstrated or suspected effects on capacity for heavy work, precision, and dexterity, and in its relation to fatigue, comes into direct relation with industry. In the Millbank symposium, W. H. Forbes reaches the conclusion that, though definite proof on most points is lacking, light or moderate or even hard physical work adds primarily to the caloric requirements and raises little, if at all, the needs for protein and vitamins A, C, D, and K, The need for the B complex may be increased somewhat but probably less than in proportion to the extra calories until the work becomes hard or exhausting, when it almost certainly rises considerably.

In some industries a major concern arises from the hazard of exposure to occupational poisons. To reduce the risk, our basic measures designed to lessen exposure to toxic material may be reënforced in certain cases by increasing the resistance of the workers through better nutrition. W. E. Crutchfield, Jr., reviews present knowledge concerning the effects of specific types of poisonings upon human nutrition and of improved nutrition upon resistance to these toxicities.

It is gratifying that the Government has been mindful of its opportunities to help in the solution of the problems bearing upon nutrition in industry. Explaining the vast network of interrelationships involved, Robert S. Goodhart reviews the organization and accomplishments of the Government's industrial feeding program and indicates the major problems to be solved. Under federal encouragement and advice, substantial progress has been made in this difficult and intricate task.

Finally, nutrition has its applications in the important area of geriatrics. The influence of dietary deficiency upon the skin and hair of animals is well known; and recent observations in Newfoundland,[5] where dietary deficiency is serious and widespread, revealed women in their twenties with the harsh and wrinkled skins of ancient crones. It would be surprising if such changes in the skin were not reflected in more vital organs.

All this is of importance to the health officer in connection with his programs of maternal and child welfare, of tuberculosis control and industrial hygiene. It also emphasizes the need for a broad attack on the fundamental problem of nutrition as a national issue. Such an attack should be made along at least three lines. We need to continue and supplement national and state regulations providing for the preservation or addition of essential food elements in certain staple foods. The A.P.H.A. has, for example, adopted an official resolution calling for the continuation of the enrichment of bread after the war and the *Journal of the American Medical Association* endorsed this policy in a recent issue. In the second place, we must continue and expand our program of popular health instruction along nutritional lines. Third, we must work for the development of facilities by which the people can actually apply the knowledge they acquire, particularly through the development of adequately supervised industrial cafeterias. A beginning has been made; but we are, on the whole, far behind England and the Soviet Union in this respect.

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THE EXPANDING SCOPE OF PUBLIC HEALTH LABORATORIES

THE Health Department Laboratory of New York City reported in 1900 (eight years after it was established as the first city diagnostic laboratory in the United States) 25,057 examinations for recognition of diphtheria cases and carriers, 5,363 tests for tuberculosis, 2,097 Widal tests, and 27 histological specimens examined. Forty years later, in 1940, the New York City Laboratory reported nearly one million examinations—631,499 for syphilis, 92,193 for diphtheria, 80,134 for tuberculosis, 59,891 for gonorrhea, 16,457 spinal fluid tests, 13,821 stool examinations, 6,452 tests for pneumonia, with smaller numbers for melitensis, tularemia, and other diseases of which we never dreamed in 1900.

Each year sees new examinations added to the list of public health laboratory procedures, such as the typing of pneumococci, streptococci, and typhoid bacilli, the classification of Salmonellas and the dark-field examination for syphilis. Each year witnesses growth and development of laboratory methods for the control of water and milk supplies and shellfish. Each year sees our better city and state laboratories making fundamental and important research contributions toward the improvement of techniques and, sometimes, adding to our basic knowledge of epidemiology.

In a few instances we have witnessed even more radical expansion—far beyond the basic concepts of Vaughan at Ann Arbor and Park in New York. It has always been the function of the public health laboratory to aid the physician, as well as the health officer, in the diagnosis and isolation of the germ diseases. For other types of laboratory service the physician has relied on his own assistants or on a hospital laboratory for expert chemical and pathological advice. This is obviously right and proper, where such facilities exist. In certain instances, however, as in Fulton and Montgomery Counties, New York, the public authorities have been highly successful in providing a much needed wider service.

In Montgomery County, for example, a County Laboratory, supported entirely by state and county funds provides—as a free public service—for a population of 70,000, not only the usual diagnostic and sanitary services but also all the medical tests which in most other communities are the task of hospital or private pathologic laboratories. This includes all autopsies, surgical pathology, hematology, serology, blood grouping, urinalysis, chemistry of blood and other body fluids, bacteriology, bacterial agglutination tests, preparation of bacterial vaccines, gastric analysis, basal metabolism, examination of feces and exudates. Electrocardiograms are taken by laboratory technicians but are interpreted by attending physicians.

Branch laboratories are maintained at the three hospitals of the county and are available at all hours, day and night, on the call of physicians. Autopsies are

performed not only in the hospitals but in the homes of private patients, in undertakers' establishments, or any other convenient place.

The director and staff of the laboratory are selected by County Civil Service. The director is a diplomate of the American Board of Pathology in Pathologic Anatomy and Clinical Pathology.

The cost of the service is 50 cents per capita per annum, a figure for which comparative costs on a fee-for-service basis are not, so far as we are aware, available.

The chief advantages of the plan, as reported by the Director are:

1. The centralization of all types of medical and public health laboratory work in one organization, thus eliminating a good deal of duplication and making better use of plant, apparatus, and personnel.
2. As a consequence of this centralization, it is possible to give a small community adequate laboratory service when the amount of work would not be sufficient to support several different hospital, public health, and private laboratories.
3. A great deal of red tape, such as sending out bills and deciding who shall pay for laboratory work of indigents, as well as the humiliation of indigents by investigations, is avoided.

There may be other areas than Fulton and Montgomery Counties where a program of this kind might prove desirable and acceptable.

THE 74TH ANNUAL MEETING

POSTPONED

Following is the action taken by the Executive Board on January 26, 1945, with regard to the 74th Annual Meeting:

> The President of the United States, the Director of War Mobilization and Reconversion, and the Office of Defense Transportation have declared, in effect, that an emergency exists with regard to the nation's transportation and hotel facilities, and that the cessation of group meetings and conventions involving more than fifty persons will partially relieve it. Accordingly, by authority of the actions taken by the Governing Council on October 13, 1943, and October 4, 1944, the Executive Board of the American Public Health Association VOTES to postpone the 74th Annual Meeting of the Association scheduled to be held in Chicago, Illinois, the week of September 17, 1945. The question of an Annual Meeting, however, shall be reopened as soon as conditions permit.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

All books reviewed in these columns may be purchased through the Book Service.

Health Practice Indices—*Compiled from the Evaluation Schedules; Prepared by the Subcommittee on Manual of Practice and Appraisal of Local Health Work for the Committee on Administrative Practice of the A.P.H.A. New York: A.P.H.A.*, 1944. 116 pp. Free on request.

Graphs showing results obtained rather than work performed in the field of public health is the objective of the recent publication, *Public Health Indices* of the Committee on Administrative Practice. Each item considered is one that is accepted as indicative of health conditions in any city. The graphs were prepared from the reports submitted by the cities entered in the 1943 National Health Honor Roll.

It is disconcerting, to say the least, to see the great variation of attainment. This is especially true when it is considered that the records were submitted for rating on an Honor Roll and might therefore reasonably be expected to show the attainment of cities above the average in active health services and having health minded citizens. There is evidence of greater achievement and more uniform attainment by the cities in the field of sanitation, including adequate sewage disposal and approved water supplies, than in other fields. Communicable disease control—even of the diseases for which we have specific means of prevention—tuberculosis control, maternal and infant care, in fact, all the fields of activity that are considered the special function and duty of health departments, show great variation of attainment.

It has been noted that a few health officers have used the graphs as a basis for their annual reports. Even though one's own city is not shown, the record may be inserted so he may know how his city compares with the cities that were entered. Lantern slides of the graphs with a particular city indicated offer an unusual opportunity to publicize the work that is being done or should be done, as well as satisfying the sporting instinct in any audience, and their desire to see their city make a creditable showing as compared to other cities, that is, providing it has.

Future issues of *Health Practice Indices* can be of still greater value, providing the basic questionnaire remains brief and if all health officers would consider it a duty they owe their Committee on Administrative Practice to supply the information requested.

I. F. THOMPSON

Symposium on Wartime Advances in Medicine—*Proceedings of the American Philosophical Society. Philadelphia: American Philosophical Society*, 1944. 219 pp. Price, $1.00.

Those who seek in compact form an account of important medical advances during wartime will do well to read this symposium presented before the American Philosophical Society in April, 1944. Competent authors cover the subjects of water requirements of castaways, blood derivatives and blood substitutes, present status of penicillin in treatment, recent advances in the treatment of wounds, the rôle of immunization in wartime, human problems in military aviation, environmental protection, neuropsychiatry, and trends

in the study of the control of infectious diseases. The Penrose Memorial lecture on the international labor organization completes an excellent symposium. REGINALD M. ATWATER

Mosquito Control — Practical Methods for Abatement of Disease Vectors and Pests—*By William B. Herms, Sc.D., and Harold F. Gray, Dr.P.H. (2nd ed. rev. and enlarged.) New York: Commonwealth Fund. London: Humphrey Milford, Oxford University Press,* 1944. 419 pp., illus. Price, $3.50.

The first edition, reviewed in the July, 1941, issue of this *Journal,* has proved to be a comprehensive and practical handbook for public health and mosquito abatement officials and others engaged in mosquito control work. The present revision and enlargement was necessitated by "the rapid development of new techniques of mosquito control in the past three years." The authors say: "we have eliminated obsolete material and obvious errors, have modified some opinions, and have added whatever new material appeared to us to be significant." The needs of our military and occupational forces and also the requirements of civilian workers have been considered.

The first five chapters—about 100 pages—deal mainly with the principles of mosquito abatement and the factors and methods to be considered in organizing and establishing abatement programs. The remainder of the book is devoted to the various and detailed methods of finding mosquito breeding places, identification of mosquitoes, and the numerous control methods that may be applicable in different situations. It is evident that, with a background of long experience and study of available literature, the authors have been careful in including and evaluating all known methods of mosquito abatement and control. Also their descriptions and illustrations are clear and the suggestions given are definite and practical.

Subjects on which discussion has been added or amplified include: results of effective malaria control measures; collection of mosquito larvae and eggs; ditching with explosives; ditch lining; newer larvacides (bottom oils, DDT and others); methods of applying larvacides; newer spray materials to protect against adult mosquitoes; military mosquito control; species eradication; and *Aedes aegypti* control.

About 25 illustrations have been added in the text, including a series on the details of automatic siphons for flushing small streams. The appendices now include classified lists of mosquito vectors of malaria and of other diseases throughout the world according to species, region and breeding place, detailed classifications of malaria vectors and methods for their control, and keys, diagrams, and other aids in mosquito identification.

Comprehensive bibliographies placed at the ends of chapters together with the specific and practical text, make this an essential book for expert or novice in mosquito control work.

ROY J. MORTON

Child Development. Physical and Psychological Growth Through the School Years—*By Marian E. Breckenridge and E. Lee Vincent. Philadelphia: Saunders,* 1943. 592 pp. Price, $3.25.

In their book on child development the authors have gathered together a large body of information concerning both the physical and mental development of the child. It is a book of distinct value to anyone seeking to understand the processes at work during the formative years of childhood. In their preface they state that the book "is designed for professional students in psychology, teacher training, home economics, medicine, nursing, and social

work as well as for parents," and they have approached their problem primarily in a textbook form with "Questions for Class Study" following each chapter.

It is perhaps the heterogeneity of the audience which they have chosen to address and this pedagogic approach that makes the book, though valuable in many ways, disappointing in others. The factual data are all presented with extreme conscientiousness but with curious mixtures of scientific and non-scientific phraseology, at one moment the advanced student seems to be addressed, at another the layman.

Since the authors are writing with all types of readers in mind, the material they present gives the impression of a monumental assembling of information without the selection that would be exercised in addressing a clearly defined group. This quality is less evident in the second half of the book, in which the chapters on the development of memory and growth of language as well as those on social and personality development are excellent. Here one recognizes the wise and sympathetic point of view of students of the child himself.

The authors are also to be complimented on the completeness of their bibliography, which in itself makes the book a source to which one would frequently turn for guidance in further study of the basic material that their text contains.

MARJORIE F. MURRAY

By Order of the Surgeon General—*By Samuel B. Grubbs, M.D. (Privately printed—D. D. Grubbs, Pleasant Woods Farms, Carmel, Ind.)*, 1943. 332 pp. Free to Health Departments and Associations.

This story of the professional life of the late Dr. Grubbs is of interest not only to the career officers of the U. S. Public Health Service, in which the author served for 37 years, but to others who should know what it is that underlies the esprit de corps of this remarkable organization. The style is readable throughout and at times really thrilling. REGINALD M. ATWATER

Health Instruction Yearbook, 1944—*By Oliver E. Byrd. Stanford, Calif.: Stanford University Press,* 1944. 354 pp. Price, $3.00.

Here it is! A book many public health workers have been looking for; a book many more will want when they know its contents; a book every public health officer, executive secretary, supervisor of public health nurses, field consultant, health education coördinator, librarian and college instructor should add to his or her group of essential personal desk references. Those in the special fields of nutrition, physical education, mental hygiene, dental health, etc., will find a summary of materials in their own special field, and have easily available facts for the wider area of public health.

This 1944 *Yearbook* brings together in ready reference and cross-index form, the current experience, research, and opinion relative to all phases of public health as revealed throughout the current year through articles from professional magazines, government reports, and research bulletins. The chapters are organized into both wide fields of public health as a sociological problem and into specific personal health areas. Chapters dealing with the broad sociological aspects are under such titles as: Health as a Social Accomplishment, Heredity and Eugenics, Health and Physical Environment, Community Health Service. In the same table of contents will be found chapters devoted to such personal health needs as nutrition, fatigue and rest, infection and immunity, etc.

At the beginning of each chapter, the writer makes introductory statements

which provide orientation to the area of health under presentation. Articles, reports, and bulletins are reviewed, excerpted, or quoted. Tables of facts, dates, and specific numbers are used freely. A bibliography of each publication used is easily found by corresponding numbers in the back of the book. A cross-index on a word basis makes for integration of materials.

The one unfortunate note about this book is its title, which with the foreword, seems to stamp it as "another school textbook." It certainly should find its way into schools, colleges and universities where the broad sociological aspect of health is needed in classroom instruction. Its organization and content make it also an invaluable reference for leaders and workers in public health, whose major function is to keep themselves informed of current research, opinion and experience of others, and who in turn, must help community groups, political and governmental leaders to understand social needs and trends.

REBA F. HARRIS

Proceedings and Papers of the Thirteenth Annual Conference of the California Mosquito Control Association—*Edited by Harold Farnsworth Gray. Berkeley: State Bureau of Sanitary Engineering*, 1944. 135 pp. Price, $1.50.

This conference, held at the University of California at Berkeley, in February, 1944, consisted of five sessions. The registration lists showed an attendance of approximately 135, composed largely of representatives of the Army, Navy, U. S. Public Health Service, University of California, California state and local health departments, and seventeen mosquito abatement districts. The well arranged program gave emphasis to war problems of mosquito abatement in this country and the various theaters of military operations elsewhere. The program consisted largely of symposia or lengthy single papers on important subjects. The especially prepared papers were followed by quite full discussion from the floor which was recorded, edited, and included with the papers in the proceedings.

The major subjects included were: symposium on diseases transmitted by mosquitoes in the Pacific Area; danger to civilian populations on the Pacific Coast from mosquito-transmitted infections in returning military personnel; U. S. Public Health Service War Emergency Program for Control of *Aedes aegypti* mosquitoes; a review of the more important articles on mosquito control appearing in the literature in 1942 and 1943; the California program of malaria control in war areas; symposium on mosquito control problems in South Pacific area; symposium on control methods; use of ditch lining, underground drains and sanitary fills for malaria and mosquito control; and symposium on operating problems.

This publication has the usual advantages and disadvantages of a chronological record of conferences of this sort. It includes much original information freely presented from actual experience, but is necessarily diffuse and overlaps a great deal with material already available elsewhere. The proceedings are well edited and include many useful references to the literature and a record of names associated with recent developments. Being mimeographed, the proceedings could not include the valuable illustrative materials—charts, slides, and motion pictures—which were used with and must have added greatly to the value of the discussions.

ROY J. MORTON

Virus Diseases in Man, Animal and Plant—*By Gustav Seiffert. New York: Philosophical Library*, 1944. 332 pp. Price, $5.00.

This book, in spite of its interesting title, turns out to be a disappointment. Neither author nor translator is identified in the book so that at the outset one has a feeling of doubt as to whether what he is about to read is authoritative.

The content is largely a partial and uncritical summary of current literature, and contains nothing not readily available from a number of other sources. The translator, evidently not familiar with medical terminology, does not improve the text when such phrases are used as "sound virus carriers," "breeding vira in chicken embryo tissue," and "gall seems to harm it little." The numerous errors in the names of authors quoted does not indicate that the bibliography could be relied upon.

On the whole, the book is poorly gotten up, and one is at a loss to know why it should receive the consideration that a translation usually connotes.

W. LLOYD AYCOCK

To Live in Health—*By R. Will Burnett. New York: Silver Burdett,* 1943. 332 pp. Price, $1.96 (School Edition).

Individuals concerned with secondary school health education will find *To Live in Health* a helpful text or reference book for students. Written in a stimulating and interesting style, this book presents an overall picture of the nation's health and then deals with methods of building and maintaining health and of combating disease.

The number of topics covered in this text is extensive, and includes most of those considered important in secondary school health education. Following introductory chapters on the total health problem and the rôle of the individual in combating national problems and of guarding his own health, several chapters are devoted to the body's defenses against disease. Separate chapters are devoted to communicable diseases, noncommunicable diseases, mental health, nutrition, and the avoidance and treatment of injuries. Each chapter ends with a self-testing multiple choice exercise.

A few topics important to secondary school students receive such brief presentations that students will need to supplement the material contained in *To Live in Health* with outside reading. This is, for example, true of first aid, home care of the sick, and care of children.

The book has an attractive appearance. The chapter headings are distinctive and pleasing to the eye. A number of excellent charts, diagrams, and other illustrations are used, but more could have been used to good advantage. This book in the opinion of the reviewer can be recommended for secondary school libraries and for use with high school health education classes.

CHARLES C. WILSON

Health Education for All Ages—*Compiled by Lili Heimers and edited by Margaret G. Cook. New Jersey State Teachers College, Upper Montclair, N. J. Vol. 2, 36 pp. mimeographed,* 1944. Price, $.75.

This list of teaching aids in health education directs the teacher to many excellent sources of materials. Under the headings of general information, physiology, alcohol and health, personal health, nutrition, mental hygiene, heredity and sex education, diseases and their prevention, nursing, and public welfare, specific pamphlets, charts, posters, films, etc., are listed. With most of these titles is given a brief description of the subject matter covered and some of the write-ups include suggestions for the possible use of the material. This procedure, of course, makes the list much more meaningful. It is unfortunate that such suggestions were not included for all the titles and that no system of evaluation was attempted for all the materials listed. The

value of this list for the teacher and for other workers in the field of health education might be greatly increased if the grade level were determined and indicated for each teaching aid given in the bibliography.

LUCY S. MORGAN

Maternal Overprotection — *By David M. Levy. New York: Columbia University Press,* 1943. 417 pp. Price, $4.50.

"Like clinical medicine," Dr. Levy states, "child guidance is primarily an art and not a science" . . . and . . . "like medicine, an art it must always remain." Dr. Levy's recent book, however, is a significant landmark in the development of child guidance as a scientific discipline as well as an increasingly important clinical art. *Maternal Overprotection* reports fully on an important kind of investigation which is necessary if the clinical art is to be practised more effectively, and strengthened by data and insights gained and checked by sound scientific procedures.

Since maternal over-protection is common in many cultures, particularly our own, its rôle in influencing the parent-child relationships merits the serious and careful study which Dr. Levy reports. Since over-protection often appears in an exaggerated form, its operation and effects can be seen and studied fairly easily. Dr. Levy therefore chose for intensive study case studies in which the factor of maternal over-protection appeared in magnified and apparently isolated form. Once the pattern has been established, "maternal over-protection" can be recognized more easily in cases or instances in which it is less obvious or clear-cut.

The criteria for diagnosing maternal over-protection which Dr. Levy has given are not only extremely valuable and suggestive but will be recognized as valid by all who have had extensive clinical experience. The criteria will also help the clinician distinguish "pure" over-protection from so-called "guilt over-protection," "mixed over-protection," "mild over-protection," and non-maternal forms.

Dr. Levy's discussion of the diagnosis and treatment of such cases—as well as the criteria for diagnosis—merits the careful attention of all those who are professionally engaged in child guidance in the clinic, hospital, welfare agency, or school. Parents, and parents' study groups would also be well advised to consider and discuss the implications of this study for sound child rearing. Social scientists will find the book's methodology, as well as its findings, important and helpful.

MARY S. FISHER

Baby Care During Expectancy and the First Year—*A Helpful Guide for Mothers on the Care of Infants—By May E. Law. (2nd ed. rev.) Philadelphia: Lippincott,* 1943. 13 Booklets. Price, $1.25.

The text of "Baby Care" is contained in thirteen separate leaflets of from 15 to 30 pages each and is attractively boxed for safe keeping. The first leaflet advises on the baby's care before he is born, and the other twelve cover his needs at monthly intervals. Each leaflet starts with a foreword briefly outlining the subjects considered in the text which presumably serves as a Table of Content. Next "Golden Rules" are listed. These give sound advice but too many start with the prohibitive "don't" and tend toward a negative emphasis rather than a positive angle of good care.

Each subject which is presented is headed by bold faced type providing for easy reference throughout the text. The last page of each leaflet gives a "Daily Schedule" which commendably includes the mother and a "Weight Chart" providing for a weekly record of the baby's weight beside the average

weight, even to the ounces, for each age period. There is a space to record the weekly gain with a catalog of the average gain for each period. Such detail of weight recording might easily cause the mother much worry if her child did not progress according to the schedule as outlined.

Each leaflet is generously illustrated. Some of the pictures represent good teaching, but others portray the "don'ts" of baby care. For example one caption reads "Never try to remove an object from the ear" and the picture illustrates a mother endeavoring to accomplish this feat.

The advice is given as a statement of fact without many explanations of the reasons for the procedure. Much emphasis is placed on regularity by the clock and on the detail of everyday care without allowance for the infant's individuality or the mother's imagination or household routine. Dr. Law's concept of child care compares with that in vogue five or ten years ago. Although there are many attractive features in this series of leaflets, and mothers could gain useful knowledge from reading them, there are other publications available at little or no expense which conform to the newer concepts of child care.

HELEN A. BIGELOW

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Salaams to These—Human volunteers (heroes would be a better word) inoculated with a pool of filtered throat washings demonstrated that bacteria-free filtrates, presumably containing a virus, can induce primary atypical pneumonia.

ANON. Transmission of Primary Atypical Pneumonia to Human Volunteers. J.A.M.A. 127, 3:146 (Jan. 20), 1945.

Call to Action—If the magnitude of the rheumatic fever problem is to be made known to the community, if there is to be intelligent direction, if there is to be a sustained effort to control the disease, then the medical society must play a part in stimulating community action, say these writers.

ARMSTRONG, D. B., and WHEATLEY, G. M. Community Organization for the Control of Rheumatic Fever. New York State J. Med. 45, 2:169 (Jan. 15), 1945.

Against Measles and Other Infections—Control of infectious diseases by passive immunization with blood globulins may be the greatest function of future civilian blood banks, concludes this pioneer in applied hematology.

COHN, E. J. Blood Proteins and Their Therapeutic Value. Science. 101, 2612:51 (Jan. 19), 1945.

Number One on Your List—Your attention is called to this not-to-be-missed symposium; we paraphrase the radio gag of dubious ancestry and apply it to them. "These, you must see!"

CURRAN, J. A. Provision of Better Medical Care (and eight related papers). Milbank Quart. 23, 1:7 (Jan.), 1945.

After Forty, What? — Annual physical examinations have been carried out for 15 years on a group of about 3,000 "average" adults over 40. This long-time systematic observation has produced profitable results in the early recognition of diseases among "healthy" people.

FELLOWS, H. H. Scope of an Industrial Medical Service. New York State J. Med. 45, 1:57 (Jan. 1), 1945.

Department of Hard-Dying Ideas—Now a British researcher comes forward with evidence that vaccines and other cold "preventives" do not prevent. He writes that he is "unaware of any large scale controlled test that has given any convincing proof of prevention of colds, yet a large proportion of the medical fraternity has the firmest faith in this prophylaxis." (Over 90 per cent use vaccines, he writes.)

HAGUE, D. V. Prophylaxis of the Common Cold. M. Officer. 72, 25:205 (Dec. 23), 1944.

Item to Tuck Away in Your Memory—This analysis of goat's milk indicates that it is not sufficiently different from cow's milk, in the matter of vitamins, for us to get excited over its superior nutritional qualities. There was a wide variation in the various vitamin determinations among the samples, but the averages were higher in some—and lower in other—vitamin values than for cow's milk.

HOLMES, A. D., *et al.* The Vitamin Content of Commercial Winter Goat's Milk. New England J. Med. 232, 3:72 (Jan. 18), 1945.

Quote—Almost 4,000,000 men have been rejected for military service. Of the total number of rejections, 30 per cent were for reasons of mental deficiency and mental diseases. Unquote. That is a statistic which must be driven irremovably into the consciousness of every health administrator even if it requires a sledge hammer to do it.

KOPETZKY, S. J. Validity of Psychiatric Criteria for Rejection for Service with the Armed Forces. War Med. 6, 6:357 (Dec.), 1944.

Anent TB Preventoria—Perhaps this nubbin is enough to guide you in your decision to read or pass up this paper: "There was no evidence that rest in bed influenced in any way the course of the primary complex or reduced the incidence of complications and no evidence that lack of rest in bed was in any way detrimental."

LEVINE, M. I. Primary Tuberculosis. Am. J. Dis. Child. 68, 6:385 (Dec.), 1944.

Silver-Lining Department—Gains from wartime advances in our knowledge of malaria control outweigh the adverse effects of possible spread of the disease and its vectors; so concludes this writer, who ought to know.

MCCOY, O. R. Malaria and the War. Science. 100, 2607:535 (Dec. 15), 1944.

From a Plant Physiologist—So well said that it deserves direct quotation, we spread before you this treat. "In some cities there are even special 'vitamin shops' or 'bars.' The vitamin fad has become an epidemic. While most people have only a vague idea what vitamins are, excepting that they are connected with the alphabet, still this does not prevent them from becoming enthusiasts, even faddists. Evidently it keeps them happy."

MURNEEK, A. E. Vitamins in Our Food. Science. 100, 2608:557 (Dec. 22), 1944.

Vision — Wisconsin proposes the establishment of a competent state district health service to offer opportunities to returning service men trained in public hygiene.

NEUPERT, C. N. Now Is the Time to Start Our Post-War Health Program. Wisconsin Quart. Bull. 7, 12:3 (Oct.-Dec.), 1944.

More about Polio—In this down-to-earth discussion of the epidemiology of polio, most of the theories about the mechanism of its spread are presented and analyzed. At the end, the reasons for assuming that usually the infection is spread through person-to-person contact are given. Control measures are discussed with an equal lack of partisanship.

PERKINS, J. E. The Epidemiology of Poliomyelitis. New York State J. Med. 45, 2:159 (Jan. 15), 1945.

Morbid Categories—This study furnishes a basis for the concept that streptococcal infections change their clinical pattern with age. There are distinct childhood and adult types of streptococcosis.

POWERS, G. F., and BOISVERT, P. L. Age as a Factor in Streptococcosis. J. Pediat. 25, 6:481 (Dec.), 1944.

Stet—In the absence of organic disease, a person who consumes adequate amounts of the protective foods does not need additional vitamins. Vague symptoms are not likely to be due to vitamin deficiencies. Prolonged vitamin therapy in the absence of disease is useless.

RUFFIN, J. M. The Use and Abuse of Vitamins in the Treatment of Mild or Early Deficiency States. Nutrition Rev. 2, 12:353 (Dec.), 1944.

In a **Very General Way**—Another paper supporting the thesis that children may be immunized against whooping cough with vaccine. Pertussis toxin and antitoxin are not reliable agents for the prevention and treatment of the disease, this researcher reports. Skin tests are not reliable indices of immunity.

SILVERTHORNE, N. Whooping Cough. J. Pediat. 25, 6:584 (Dec.), 1944.

Heat from Pipes—Health administrators interested in public housing will wish to read this exhortation to their British brethren to adopt community heating. It seems the Russians began this is a big way and the reporter is greatly impressed with the results.

SMITH, D. V. H. District Heating and the Smokeless City. J. Roy. San. Inst. 65, 1:28 (Jan.), 1945.

Brighter Future—Army doctors who know about modern venereal disease treatment will return to civil practice. Ten million soldiers who know about venereal disease dangers will dilute popular ignorance. Experience with mass groups will add to our preventive armamentarium. Add these factors and you have cause for optimism, say these writers.

STERNBERG, T. H., and LARIMORE, G. W. Army Contributions to Post War Venereal Disease Control Planning. J.A.M.A. 127, 4:209 (Jan. 27), 1945.

Tuberculosis—A Social Index—A little late in the day—Volume II having been completed—we greet this new quarterly journal of the (Br.) Central Council for Health Education published for the edification of teachers, welfare, medical, and health educational workers. The occasion to greet *Health Education Journal* is this note on a tuberculosis paper which makes the excellent point that the disease is a sensitive barometer of the state of environmental well-being and community health services. Tuberculosis is the No. 1 social disease.

WILLIAMS, H. Total War on Tuberculosis. H. Education J. 2, 4:162 (Oct.), 1944.

A Record—Few of us could quote without qualification a public statement of opinion made three decades earlier. But without uncrossing a "t" this writer repeats a paragraph from a speech made in 1911. He said then, "In my judgment the visiting nurse is the most important figure in the modern movement for the protection of the public health."

WINSLOW, C.-E. A. Has Public Health Nursing Reached Its Destination? Pub. Health Nurs. 36, 12:609 (Dec.), 1944.

BOOKS RECEIVED

AIDS TO CLINICAL PATHOLOGY. Including Post-Mortem Technique. By David Haler, M.B. Baltimore: Williams & Wilkins, 1944. 358 pp. Price, $2.00.

CHINA'S HEALTH PROBLEMS. By Dr. Szeming Sze. Washington, D. C.: Chinese Medical Association, 1944. 76 pp. Price, $1.00.

DEDICATORY ADDRESSES. School of Public Health, University of Michigan. 1943–1944. By Thomas Parran, Haven Emerson, James Stevens Simmons, and Marion W. Sheahan. Ann Arbor: University of Michigan, 1944. 56 pp.

A DIGEST OF THE LITERATURE ON DDT. By R. C. Roark and N. E. McIndoo. Washington, D. C.: U. S. Department of Agriculture, 1944. Publ. No. E-631. 53 pp.

ENDOCRINOLOGY. A BRIEF REVIEW FOR PHYSICIANS. By James H. Hutton, M.D. Springfield: The Illinois Department of Public Health with the coöperation of the Illinois State Medical Society, 1944. 169 pp. Free to Illinois physicians.

EXPERIMENTAL BASIS FOR NEUROTIC BEHAVIOR. Origin and Development of Artificially Produced Disturbances of Behavior in Dogs. By W. Horsley Gantt, M.D. New York: Hoeber, 1944. 211 pp. Price, $4.50.

HEALTH INDUSTRY. London: Automatic Telephone & Electric Co., Ltd., 1944. 52 pp. Price, $.50.

HEALTH AND MEDICAL CARE. NIAGARA COUNTY, NEW YORK. Resources and Needs for Health and Medical Care in Niagara County, New York. Study made by the New York State Health Preparedness Commission in coöperation with the Local Health Preparedness Committees in Niagara County. New York: New York State Health Preparedness Commission, 1944. 84 pp. Free from publisher, 292 Madison Avenue, New York, N. Y.

HIGHLIGHTS OF HEALTH AND MEDICAL CARE. NIAGARA COUNTY, NEW YORK. A Summary of Resources and Needs for Health and Medical Care in Niagara County, New York. Study made by New York State Health Preparedness Commission in cooperation with Local Health Preparedness Committees in Niagara County. New York: New York State Health Preparedness Commission, 1944. 10 pp. Free from publisher, 292 Madison Avenue, New York, N. Y.

HIGIENE Y SALUD PUBLICA. By Charles Frederick Bolduan, M.D., and Nils William Bolduan, M.D. Bogota, S. A. Editorial Antena, 1943. 268 pp.

INTRODUCTION TO PARASITOLOGY. With Special Reference to the Parasites of Man. 7th ed. By Asa C. Chandler, Ph.D. New York: Wiley, 1944. 716 pp. Price, $5.00.

THE MARIHUANA PROBLEM IN THE CITY OF NEW YORK. Sociological, Medical, Psychological and Pharmacological Studies. By the Mayor's Committee on Marihuana. Lancaster: The Jaques Cattell Press, 1944. 220 pp. Price, $2.50.

PHYSICAL GROWTH FROM BIRTH TO TWO YEARS: I. Stature. A Review and Synthesis of North American Research for the Period 1850–1941. By Howard V. Meredith, Ph.D. Iowa City: University of Iowa Press, 1943. 337 pp. Price (paper), $1.50; (cloth), $1.75.

THE ROMANCE OF MEDICINE. The Story of the Evolution of Medicine from Occult Practices and Primitive Times. By Benjamin Lee Gordon, M.D. Philadelphia: Davis, 1944. 624 pp. Price, $5.00.

SCHOOL'S OUT. Child Care Through Play Schools. By Clara Lambert. New York: Harper, 1944. 225 pp., illus. Price, $2.50.

SOLDIER TO CIVILIAN. Problems of Readjustment. By George K. Pratt, M.D. New York: McGraw-Hill, 1944. 233 pp. Price, $2.50.

SELECTED FOOD AND NUTRITION PUBLICATIONS. New York: The Committee on Evaluation of Printed Materials. New York City Food and Nutrition Program, 1944. 12 pp. Price, $.25.

TECHNIQUE OF THE STANDARD KAHN TEST AND OF SPECIAL KAHN PROCEDURES. By Reuben L. Kahn. Ann Arbor: University of Michigan, 1944. 52 pp. Price, $.25.

TUBERCULOSIS REFERENCE STATISTICAL YEARBOOK FOR 1943. With comparative summaries for 1942, and five-year period 1939–1943. New York: New York Tuberculosis and Health Association, 1944. 40 pp. Free from publisher, 386 Fourth Avenue, New York, N. Y.

WHAT IS TUBERCULOSIS? ITS CONTROL AND PREVENTION. By Milosh Sekulich, M.D. London: Research Books Ltd., 1944. 96 pp. Price, $1.00.

ASSOCIATION NEWS

Announcement
of
A Reporting Area for Health Practices

The Committee on Administrative Practice of the American Public Health Association Announces a Plan for Developing a Reporting Area for Health Practices to succeed the National Health Honor Roll, formerly the Inter-Chamber Health Conservation Contest.[1]

THE Reporting Area for Health Practices represents a logical development after long experience in the appraisal of local health work. It is a service that the Association has been encouraged to give as a result of growing appreciation of the *Evaluation Schedule, Health Practice Indices,* and the consultant service to local communities and to state directors of local health service.

This project, made possible through a grant from The Commonwealth Fund of New York, is sponsored in the United States by the A.P.H.A., and in Canada by the Canadian Public Health Association in coöperation with the A.P.H.A.

The plan has wartime significance. It is particularly well adapted for the analysis of facilities in war-expanded localities and is an aid to post-war planning.

The contest feature or granting of awards to high-scoring communities has been discontinued.

Local Participation—All county, city-county, and multiple county health departments providing full-time health service, together with cities of over 25,000 population with full-time health service, may fill out *Evaluation Schedules* and submit them to the A.P.H.A. as early as possible in 1945, but in no event later than April 15. Schedules will be welcomed from communities in continental United States, Alaska, Hawaii, Puerto Rico, the Virgin Islands, and the Dominion of Canada. These schedules will be graded. Grading Charts and interpretive letters will be returned to communities. A new issue of *Health Practice Indices* will be published containing the results of the grading in chart form. Communities, whose schedules contain adequate material, will be listed in *Health Practice Indices* as constituting the Reporting Area for Health Practices.

The new issue of the "Indices" will include the data now shown in the 1944 edition, to which will be added the data from schedules newly submitted in 1945. Where a community represented in the 1944 edition also submits data for the 1945 edition, the latter data will be substituted for that of the previous year.

State Participation—Following the practice of recent years, the service is linked with that of state health departments. Under this plan the state health department makes contact with its own communities, inviting their participation. Schedules are distributed by the states. When completed, two schedules are returned to the state department of health, which in turn forwards one copy from each community to the A.P.H.A. Eight states have already indicated their intention to follow this plan. The completed schedule provides the state with concrete information on local health work. This material is invaluable to the bureau of local health service as well as to the participating community.

New Features Planned for "Health

Practice Indices"—The lines in the charts of this annual series will be given identifying numbers. Each community will be informed of its own number. This will enable a community to determine its standing in the different charts. The names of communities in the Reporting Area will be shown. The names of state health departments actively participating in the promotion of the program will likewise be indicated.

Advantages in Local Health Evaluation—Each participating community profits from a study of its own public health facilities, utilizing a standard form. Committee participation with the health officer in filling out the schedule enlarges community understanding and support of local health needs. A community is contributing to the advancement of public health generally, thus making available a widespread sampling of existing health practices. By representation in *Health Practice Indices* a community can see itself in the "mirror" of nation-wide health practices. The charts with local positions indicated provide useful material in community health education either through lantern slides or printed reproductions.

In the development of this program many community organizations, such as chambers of commerce, civic luncheon clubs, parent-teacher associations, women's clubs, tuberculosis associations, the press, etc., are in a position to aid substantially and effectively in bringing the program to its greatest fruition. For those interested in establishing health committees through chambers of commerce, useful information may be obtained by writing directly to the U. S. Chamber of Commerce, Washington, D. C.

Schedules are now available and may be obtained directly from the A.P.H.A. or through state health departments.

REFERENCE

1. *A.J.P.H.*, 34, 10:1099 (Oct.), 1944.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

George M. Anderson, M.D., State Capitol, Cheyenne, Wyo., State Health Officer

Daniel S. Baughman, M.D., 900 Washington Ave., N.E., Madison, S. D., Supt. Lake County Board of Health

Charles H. Blandford, M.D., Hardin County Health Dept., Elizabethtown, Ky., Director

Albert R. Da Costa, M.D., 129 N. Virginia St., Reno, Nev., City-County Health Officer

Mortimer S. Falk, M.D., M.S.P.H., Denver General Hospital, Denver 4, Colo., Asst. Surgeon (R), U. S. Public Health Service, Denver Rapid Treatment Center

Michael G. Frich, M.D., Monroe County Health Dept., Box 32, Key West, Fla., Health Officer

John W. Gilmore, M.D., 529 Main St., Wheeling, W. Va., City-County Health Commissioner

Ralph L. Gorrell, M.D., 723 Arizona, Trinidad, Colo., Director, City-County Health Unit

Paris L. Gray, M.D., Box 428, Elkins, W. Va., Randolph County Health Officer

Raymond F. McAteer, M.D., 11 E. Main St., West Warwick, R. I., District Health Officer

William E. Mountford, M.D., Bureau of Health, City Hall, Trenton, N. J., City Health Officer

J. E. Offner, M.D., 500 Ogden Ave., Fairmont, W. Va., State Health Commissioner

Paul T. Powell, M.D., Kay County Health Dept., Ponca City, Okla., Director

Henry D. Reid, M.D., C.M., Lancaster Hospital, P. O. Box 120, Fairville, N. B., Canada, Medical Officer in Charge, Quarantine Station, Dept. of National Health and Welfare

Luiz Barbosa Romeu, M.D., 426 N. Ingalls, Ann Arbor, Mich., Student, Univ. of Michigan School of Public Health (Health Officer, Brazil)

Ruy Soares, M.D., Univ. of Michigan School

of Public Health, Ann Arbor, Mich., Student (Health Center Chief, Brazil)

Plinio Teofilo de Aguiar, M.D., Univ. of Michigan School of Public Health, Ann Arbor, Mich., Student (Health Center Chief, Brazil)

Carl H. Wendel, C.P.H., 574 Valley St., Maplewood, N. J., Health Officer

David B. Wilson, M.D., M.P.H., U. S. Public Health Service, Bethesda 14, Md., Surgeon

Roy H. Wilson, M.D., Richfield, Utah, Deputy State Health Officer and Director, District 5

Foster H. Young, M.D., Kingstree, S. C., Medical Director, Williamsburg-Clarenden Counties

Laboratory Section

Margaret R. Baker, M.D., Children's Hospital, Akron, Ohio, Bacteriologist

Raul Juan Brea, 806 E. Kingsley St., Ann Arbor, Mich., Student, Univ. of Michigan School of Public Health

John S. Bryan, 641 Parkway Ave., Trenton 8, N. J., Director of Technical Control, Walker-Gordon Laboratory Co.

Daniel A. Carrara, C.Ph.M., U.S.N., Laboratory, Naval Dispensary, Navy Dept., Washington, D. C., In Charge of Dispensary Laboratory

Capt. Leon J. Cohen, M.C., Chief of Laboratory, Station Hospital

Hunter S. Cook, M.D., 235 N. 15th St., Philadelphia 2, Pa., Acting Head, Dept. of Bacteriology and Preventive Medicine, Hahnemann Medical College

Capt. Charles C. Croft, Sn.C., 4th Service Command Medical Laboratory, Fort McPherson, Ga., Chief, Venereal Disease Diagnosis Dept.

Gilman K. Crowell, M.S., State Dept. of Health, Concord, N. H., Director, Div. of Food and Chemistry

C. N. Wentworth Cumming, Carworth Farms, Inc., Rockland County, New City, N. Y., President

Dorothy P. Deutsch, Middletown Milk & Cream Co., Inc., Slate Hill, N. Y., Laboratory Technician

John F. Enders, Ph.D., 25 Shattuck St., Boston, Mass., Harvard Medical School, Bacteriology and Immunology

Helen B. Funk, M.S., Milwaukee-Downer College, Milwaukee 11, Wis., Instructor of Bacteriology and Zoölogy.

Lila B. German, P. O. Box 225, Fulton, N. Y., Bacteriologist, Sealright Co., Inc.

Josephine L. Gilmore, 29th Court, Pueblo, Colo., Bacteriologist, Rapid Treatment Center

Harlan A. Howard, M.S., 750 N. Pleasant, Amherst, Mass., Chemist and Bacteriologist, Howard Laboratories

Leon S. Idoine, 2257 Lawrence Ave., Toledo 6, Ohio, Instructor of Bacteriology, University of Toledo

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Bei-tsung Li, 1534 Stockwell Hall, Ann Arbor, Mich., Student, Univ. of Michigan School of Public Health

Milan V. Novak, M.D., 1853 W. Polk St., Chicago 12, Ill., Prof. and Head, Dept. of Bacteriology and Public Health, Univ. of Illinois

Robert J. Patrick, M.S., Michigan State College, East Lansing, Mich., Instructor, Dept. of Bacteriology and Public Health

Lois G. Pine, 833 N. Spaulding Ave., Los Angeles, Calif., Laboratory Technician, Los Angeles County Health Dept.

Estelle F. Richmond, 35 S. Eastfield Ave., Trenton 8, N. J., Asst. City Chemist

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Gladys E. Sather, 5015 Lawton Ave., Oakland 9, Calif., Teaching Asst., School of Public Health, Univ. of California

Capt. Morris Solotorovsky, Bacteriologist and Serologist

Max T. Trainer, M.S., AAF Regional Station Hospital, AFTAC, Orlando, Fla., Senior Medical Technician

Mary E. Woodrow, Box 2323, W. Jackson P. O., Jackson, Miss., Bacteriologist, State Hygienic Laboratory

Vital Statistics Section

Cathryn M. Barrick, P. O. Box 2637, Boise, Ida., Junior Public Health Representative, U.S.P.H.S.; Record Analyst, Idaho Rapid Treatment Center

Ernest A. Lowinger, M.D., 444 Aldine Ave., Chicago, Ill., Deputy Registrar and Section Chief of Vital Statistics, Dept. of Health

Robert L. McNamara, Ph.D., U.S.P.H.S., Bethesda, Md., Social Science Analyst, National Tuberculosis Assn.

Capt. Frank A. Weck, M.A.C., Office of The Surgeon General, U. S. Army, Washington, D. C., Insurance and Medical Statistics

Engineering Section

Harold G. Baugh, Box 349, Wahiawa, Oahu, T. H., Engineer of Water and Sewage, U. S. Army

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William C. Strom, 552 N. Yolo St., Willows, Calif., Sanitary Inspector, State Dept. of Public Health

Clair V. Swearingen, City Water Co., Chattanooga, Tenn., Chemist

Industrial Hygiene Section

Valliant C. Baird, M.D., P. O. Box 2180, Houston 1, Tex., Chief Physician, Humble Oil & Refining Co.

Beatrice B. Berle, M.D., c/o Ambassador A. A. Berle (Rio de Janeiro), Dept. of State, Washington, D. C., Chief Medical Officer, War Production Board Health Unit; Surgeon (R), U.S.P.H.S.

Lt. Col. Emil B. Cekada, M.C., Asst. Surgeon, A.U.S.

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Food and Nutrition Section

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Public Health Education Section

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Anette Jacobsen, Public Health Nurse, Seldovia, Alaska, Territorial Dept. of Health

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Hazel H. Losseff, D.P.H., P. O. Box 1566, West La Vegas, N. M., Supervising Nurse, Dist. 5, State Dept. of Public Health

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Virginia P. Osborne, 101 N. Columbus St., Doniphan Bldg., Alexandria, Va., Director and Supervisor, Alexandria Visiting Nurse Service, Inc.

Alice G. Peak, Cheshire, Conn., Director, Waterbury Visiting Nurse Assn.

Helen M. Piampiano, 484 William St., East Orange, N. J., Exec. Director, Newark Visiting Nurse Assn.

Mary K. Safford, R.N., 821 Second Ave., Gallipolis, Ohio, Industrial Nurse, Medical Division, General Chemical Defense Corp. (Pt. Pleasant, W. Va.)

Isabel H. Smith, 1132 Richmond Rd., South Euclid, Ohio, Instructor of Public Health Nursing, St. Lukes Hospital, School of Nursing

Helen B. Snow, 710 Highland Ave., Newark 4, N. J., Territorial Supervisor, Metropolitan Life Insurance Co.

Epidemiology Section

Luis Alberto Boquin, M.D., 601 Catherine St., Ann Arbor, Mich., Student, Univ. of Michigan School of Public Health

Neil D. Josephson, M.D., Box 142, Yale School of Medicine, New Haven, Conn., Student

Lt. Comdr. Albert A. Weathersbee, U.S.N., District Medical Office, N.O.B., Norfolk 11, Va., District Malariologist, Fifth Naval District

School Health Section

Evelyn A. Ellingson, Mich. Dept. of Health, Lansing, Mich., Regional Public Health Nursing Consultant

Viola E. Pillot, R.N., 45 Oakland Ave., Huntington, N. Y., Teacher and School Nurse, Huntington Public Schools

Albert Reinherz, Ph.D., 4 Carol Ave., Brookline 46, Mass., Interested in health education in schools

Dental Health Section

Charlotte S. Greenhood, D.D.S., Univ. of California College of Dentistry, Medical Center, San Francisco 22, Calif., Chairman, Div. of Dental Hygiene

Aida Illueca-A, D.D.S., 1001 E. Huron, Ann Arbor, Mich., Student, Univ. of Michigan School of Public Health

Unaffiliated

Odin W. Anderson, M.A., 521 S. Forest, Ann Arbor, Mich., Instructor, Univ. of Michigan School of Public Health

George Brock Chisholm, M.D., 137 Acacia Ave., Ottawa, Ont., Canada, Deputy Minister of National Health, Dept. of National Health and Welfare

Arthur Fishman, 166 Ash St., Waltham, Mass., Student of Veterinary Medicine, Middlesex University

Cpl. A. E. Hollenbeck, 2916 Steiner St., San Francisco 23, Calif., Laboratory Technician, Dante Annex, Letterman General Hospital

Marion Thomas Jeffries, 512 Florida Bank Bldg., Orlando, Fla., State Representative, National Foundation for Infantile Paralysis, Inc.

Frank V. Meriwether, M.D., 852 U. S. Custom House, Chicago, Ill., Director, Dist. 3, U. S. Public Health Service

Herbert P. Ramsey, M.D., 1726 Eye St., N.W., Washington 6, D. C., Chairman, Washington Metropolitan Health Council of Social Agencies

Helen D. Rysan, M.A., 864 W. 4th St., Salt Lake City 4, Utah, Medical Social Worker, State Dept. of Health

Joseph I. Sollins, 1073 W. Kensington Rd., Los Angeles 26, Calif., Food Poisoning Investigator, City Health Dept.

Allan Stone, 303 Wilder Bldg., St. Paul 2, Minn., Exec. Secy., St. Paul and Ramsey County Public Health Survey

Wendell Holmes Tisdale, Ph.D., DuPont Experiment Station, Wilmington, Del., Manager, Pest Control Research Section, Grasselli Chemical Dept.

Carl Westerman, Warren and Morris Streets, Jersey City 2, N. J., Secretary, Onyx Chemical Corp.

DECEASED MEMBERS

Gordon B. Moffat, M.D., D.P.H., Kalamazoo, Mich., Elected Member 1931, Health Officers Section

Myron T. Townsend, Ph.D., Bloomington, Ill., Elected Member 1938, Public Health Education Section

JOURNALS WANTED

The A.P.H.A. headquarters has exhausted its supply of June and August, 1944, issues of the JOURNAL. Any Journals for 1939 through 1944 will be welcome, and can be used. Members who can spare these issues are requested to send them (collect) to the A.P.H.A. at 1790 Broadway, New York 19, N. Y.

EMPLOYMENT SERVICE

POSITIONS AVAILABLE

(Supplemental to lists in recent JOURNALS)

Wanted: California State Bureau of Industrial Health has immediate opening for assistant industrial hygiene engineer, temporary appointment pending civil service examination. Salary range $215–$275 per month, plus $25 per month wartime increase. Address Chief, Bureau of Industrial Health, 2002 Acton St., Berkeley 2, Calif.

Wanted: Director for well established health department in Mecosta and Osceola Counties. Permanent position for qualified public health physician. Salary range depends on training and experience. Apply Mildred Bauer, R.N., Acting Director, Mecosta-Osceola Health Dept., Big Rapids, Mich., giving full information with first letter.

Wanted: Health education worker, experience in group work desirable but not essential. Salary $1,800–$2,400 plus $35 car allowance, depending upon qualifications. Apply **Box P**, Employment Service, A.P.H.A.

The Personnel Department, State of Connecticut, Hartford, has announced open competitive examinations for the position of Local Health Consultant. The salary range is from $5,100 to $5,700 per annum. The last date for filing application is March 31, 1945. The appointee would act in an advisory capacity to the Bureaus of the State Health Department and to local health departments in relation to local health administration. Requirements include United States citizenship and graduation in medicine with not less than five years' employment in public health work including experience as a health officer or a completion of postgraduate training in public health work and three years' employment of similar type. Application form PLD-1 may be obtained from the Personnel Department.

Physician Wanted immediately for position of assistant health officer to direct Maternal and Child Health program. Man or woman physician with pediatric or public health training preferred. Position permanent. Travel expenses paid or car furnished. Salary $5,460 to start. Apply E. E. Palmquist, M.D., King Co. Health Officer, 402-L County-City Bldg., Seattle 4, Wash.

Health Educator Wanted: Position available now. Salary to start $3,000 plus travel expense or car furnished. Applicants must have at least bachelor's degree with some specialized training in health education. Experience desirable. Apply E. E. Palmquist, M.D., King Co. Health Officer, 402-L County-City Bldg., Seattle 4, Wash.

Wanted: Director of Laboratories for Milwaukee Health Department. Training and experience in both chemistry and bacteriology required. Apply to City Service Commission, City Hall, Milwaukee 2, Wisconsin.

Advertisement

Opportunities Available

WANTED—(a) **Public Health physician; municipal** department of health; generalized program; work includes well baby clinics, maternity centers, preschool clinics and venereal work for the indigent; woman eligible; college town of 100,000, not far from Chicago. (b) **Medical superintendent to direct hospital** group; duties include directing division of public health; county-operated institution; wealthy county having population of 75,000; Pacific Coast. (c) Woman physician to serve as chairman, department of health and physical education, co-educational college; department preferably one of the most modern in the country; town of 5,000 located short distances from two university medical centers; Fall appointment. (d) College health physician; 400 students; part-time appointment, opportunity for developing private practice; Philadelphia area. **PH2-1** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago, Ill.

WANTED—(a) Director of public health program; generalized public health nursing program; new division of public health; city-county health department, Southwest. (b) Outpatient supervisor; five and a half days week; $2,300, meals; 500 bed teaching hospital; Middle West. (c) School nurses; duties consist of supervising health in high school and junior college; approximately 450 students; preferably someone who could teach class in physiology or hygiene; $2,300–$3,000; northern California. (d) Resident instructor in public health nursing; 300 bed hospital located in university medical center, West. (e) Supervisor of public health nurses; generalized program including school and industrial nursing; staff of seven nurses; East. (f) Field nursing consultant and, also, public health consultant for hospital service; base salaries, $2,600; Middle West. **PH2-2** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago, Ill.

WANTED—(a) Industrial hygiene chemist; division of industrial hygiene, state department of health; woman eligible; $250–$300. (b) Sanitary engineer; duties consist of complete responsibility for sanitation; new ordnance plant; Indiana. (c) Industrial hygiene engineer; duties include considerable traveling; headquarters, Chicago; $3,000–$3,600. (d) Bacteriologist well qualified in medical parasitology; municipal laboratories established to utilize recently developed laboratory diagnostic procedures in connection with virus diseases; Middle West. PH2-3 The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago.

Situations Wanted

YOUNG PHYSICIAN—Well trained as flight surgeon is available; prefers position involving high altitude experimental work; experience includes planning and supervising construction of aero-medical department and high altitude test chamber; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago, Illinois.

BACTERIOLOGIST—B.S., M.S., Ph.D. degrees state university (majors: Zoology and Bacteriology); past several years, assistant professor of parasitology, state university; age, twenty-eight; ineligible military service because of non-incapacitating physical disabilities; recommended as excellent research man, possessing splendid aptitude in organization and directing research projects. For further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago, Illinois.

HEALTH EDUCATOR—B.S. in Education, M.A. in Health Education; excellent background in physical education; record of successful experience as industrial and public health counsellor. For further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago, Illinois.

YOUNG DENTIST—Veteran World War II; splendidly trained; four years, oral surgeon and chief of dental clinic and dental service of large division; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago, Illinois.

NEWS FROM THE FIELD

AMERICAN CANCER SOCIETY

J. Louis Neff, the Executive Director of the American Cancer Society (formerly the American Society for the Control of Cancer) has announced that the Society has now moved from 350 Madison Avenue to the Empire State Building, New York, N. Y. An expanded program with a change of policy is related to this move. According to Mr. Neff, for 31 years the society's program has been largely an educational effort directed toward the general public. The present expansion of program will include efforts to coördinate, encourage, and perhaps assist in cancer research projects, and to offer similar services in the field of service to the cancer patient. The annual fund raising campaign in April will this year be conducted under the chairmanship of Eric A. Johnston, President of the United States Chamber of Commerce, who has appointed a council with representatives from leaders of all walks of life. Mr. Neff reminds public health workers that they may obtain samples of several new pieces of educational literature prepared by the society on request to the New York office.

DR. RINGLE APPOINTED WASHINGTON STATE DIRECTOR OF HEALTH

Governor Mon C. Wallgren, of the State of Washington, has announced the appointment of Arthur L. Ringle, M.D., as State Director of Health, effective January 22, succeeding Lee Powers, M.D., M.P.H., who has accepted an appointment with UNRRA for overseas assignment.

Dr. Ringle, who is a graduate in medicine from the University of Colorado, has been a resident of the State of Washington since 1937, having been health officer for two counties, regional medical officer for the Farm Security Administration in the Pacific Northwest, and, since February, 1943, district health officer in Washington. He served as President of the Washington State Public Health Association in 1941.

TYPHUS COMMISSION MEMBERS DECORATED

The United States of America Typhus Commission Medal has been awarded to four members of the Commission, according to a recent announcement by the War Department. These included Colonel Harry A. Bishop, M.C., of the Army; Captain Edward Harvey Cushing, M.C., U.S.N.R.; Dr. Alexander C. Gilliam, Sr. Surgeon, U. S. Public Health Service; and Dr. Fred L. Soper, field staff member of the International Health Division, Rockefeller Foundation.

LASKER FOUNDATION AWARD TO DR. UNDERWOOD

One of two $500 cash awards of the Albert and Mary Lasker Foundation was presented recently to Dr. Felix J. Underwood, Executive Officer of the Mississippi State Board of Health, Jackson, at the 24th annual meeting of the Planned Parenthood Federation of America in New York. The award to Dr. Underwood was in recognition of having included planned parenthood services as an integral part of the public health program in the State of Mississippi.

CUBAN NATIONAL CANCER CONGRESS

The Director of the Pan American Sanitary Bureau advises, at the request of the Cuban Embassy in Washington, that the Second National Cancer

Congress will be held in Havana, May 5–21, and the Organizing Committee extends a most cordial invitation to any American physicians who may wish to attend and especially to those interested in this disease.

APPROVED COURSES FOR STUDENT DIETITIONS

The American Dietetic Association of Chicago has published a revised list of courses for student dietitians as approved by the Executive Board of the American Dietetic Association. Sixty-seven institutions are recognized in this revised list.

MILTON J. ROSENAU HONORED

The Fifth Annual Forum lecture, at the Seventh Annual Forum on Allergy in Pittsburgh, was delivered in January by Milton J. Rosenau, M.D., Dean of the School of Public Health of the University of North Carolina at Chapel Hill, and Charles Wilder, Professor of Preventive Medicine and Hygiene emeritus, Harvard Medical School, Boston, on "Serendipity in Terms of Mental Allergy." The Forum presented its fifth gold medal to Dr. Rosenau for outstanding contribution to allergy on this occasion. Dr. Rosenau is President-elect of the A.P.H.A.

NEW YORK HEART ASSOCIATION

The New York Heart Association, which since 1926 has been a part of the New York Tuberculosis and Health Association, Inc., will set up a separate organization as of April 1, according to a recent announcement made jointly by J. Burns Amberson, M.D., President of the Tuberculosis Association and Edwin P. Maynard, Jr., M.D., President of the Heart Association. According to the announcement, the expansion of the Heart Association program in the last few years made it inadvisable for the organizations to continue their associated activities.

"The growth of the Heart Association program has been so vigorous and the opportunities for progress so numerous that a separation has become necessary to permit the needed expansion of the work of both organizations." The Heart Association will have offices in the New York Academy of Medicine, 2 East 103rd Street. It has announced a forthcoming campaign to raise $150,000 to finance itself during the next two years.

NEW YORK STATE CANCELS HEALTH CONFERENCE

The Annual Conference of Health Officers and Public Health Nurses scheduled for Saratoga Springs, N. Y., in June, has been cancelled in compliance with the regulations of the federal government that conventions and other large meetings be eliminated this year, according to an announcement by Edward S. Godfrey, Jr., M.D., State Commissioner of Health. This conference usually attracted some 2,000 persons, including state and local health officers, county and local public health nurses, registrars of vital statistics, and others engaged in public health activities.

MASSACHUSETTS PUBLIC HEALTH ASSOCIATION

At the annual meeting of the Massachusetts Public Health Association held January 25, 1945, the following were elected officers of the Association for the year:

President—L. Jackson Smith, M.D., Springfield
First Vice-President—Charles F. Wilinsky, M.D., Boston
Second Vice-President—Vlado A. Getting, M.D., Dr.P.H., Belmont
Secretary—A. A. Robertson, Boston
Treasurer—Catharine Atwood, Boston
Representative to the Governing Council, A.P.H.A.—Raymond S. Patterson, Ph.D., Boston
Alternate—L. Jackson Smith, M.D., Springfield

LOCAL HEALTH UNITS FOR THE NATION

Dr. Haven Emerson, Chairman of the Subcommittee on Local Health Units, announces that the report of the Committee, "Local Health Units for the Nation" is in print and will be ready for distribution about May, 1945. The study carried on for a period of nearly two years and the resulting report were made possible by a grant of the Commonwealth Fund which is also publishing and distributing the volume.

The report, which will be about 300 pages in length, will propose 1,197 units of local health jurisdiction to cover the Continental United States in place of the more than 18,000 local jurisdictions currently responsible for local health services. It will show both existing personnel and costs for local health services in these units as well as proposed personnel and costs for basic minimum local health protection for every citizen.

PERSONALS

Central States

BRUCE M. BROWN, M.D., acting medical director of the Division of Industrial Hygiene, Iowa Department of Health, Des Moines, has been appointed the new chief of the Division of Industrial Hygiene of the Illinois Department of Public Health, effective December 1. He fills the vacancy that occurred when DR. MILTON H. KRONENBERG * resigned.

D. CLARE GATES, DR.P.H., has been appointed to a newly created position of director of health education in the Minneapolis City Health Department, according to Dr. Frank J. Hill, health commissioner. Although the civil service appointment began January 1, Dr. Gates has filled the position since November 1 through a financial grant from the Hennepin County Tuberculosis Association. Dr. Gates received his degree in public health at the University of Michigan in 1937.

HENRIETTA M. HERBOLSHEIMER, M.D.,† has been appointed chief of the Division of Maternal and Child Hygiene in the State Department of Public Health in Illinois, effective January 1. During the previous six months she filled this position as acting chief, after having been promoted from a staff position which she had held since May, 1942.

MARY PUTNAM, M.D., field physician of the Wisconsin State Board of Health, has been appointed pediatrician to the Delaware State Board of Health to direct the baby clinics carried on by the Board in the state each month and to handle several crippled children's clinics. Dr. Putnam succeeds DR. MARION S. S. DRESSLER, resigned.

MAURICE F. RABB, M.D., Shelbyville, Ky., has been named chairman of the health committee of the Negro Affairs Commission, which was created late in September by an executive decree of Governor Simeon S. Willis to recommend "practical solutions to problems confronting Negroes in Kentucky in the fields of education, health, housing, economics and civil affairs." The commission organized itself into five units, one of which is that headed by Dr. Rabb.

CLAIR E. TURNER, DR.P.H.,* formerly Professor of Public Health, Massachusetts Institute of Technology, Cambridge, Mass., is conducting a state-wide school health study in Kansas under the direction of DR. FLOYD C. BEELMAN,* Topeka, Kans., secretary and executive officer of the State Board of Health. The study aims to formulate policies, set up standards and make specific recommendations for building strong local health programs.

* Fellow A.P.H.A.
† Member A.P.H.A.

Eastern States

DR. J. BURNS AMBERSON was reëlected President of the New York Tuberculosis and Health Association at the annual meeting of the Corporation and the Board of Directors held recently.

STELLA GOOSTRAY, R.N., Director, School of Nursing, Children's Hospital, Boston, Mass., Chairman of the National Nursing Council for War Service for the past two years, was reëlected Chairman January 23, 1945. Other officers elected were ANNA D. WOLF, R.N., Vice-Chairman; PEARL MCIVER, R.N.,* Secretary; EDWARD ROBINSON, Treasurer.

ROGER GORDON has been appointed Executive Secretary of the Harlem Council on Social Hygiene, New York, N. Y., following his recent retirement as staff member of the American Red Cross. He is a graduate of the New York School of Social Work.

MAJOR WILLIAM REINER-DEUTSCH, SN.C.,† of New York, is now Chief of Laboratory Service at a General Hospital overseas.

A. DANIEL RUBENSTEIN, M.D.,† District Health Officer of the Massachusetts Department of Public Health, has been appointed Assistant in Epidemiology at the Harvard School of Public Health, Boston.

Southern States

DORA E. BRAULT, M.D., has been appointed an epidemiologist with the Massachusetts Department of Public Health. Dr. Brault was formerly with U. S. Public Health Service, her last assignment being that of assistant county health officer in Prince George County, Maryland.

W. D. BURKHALTER, M.D.,* Assistant Health Officer of the Memphis and Shelby County Health Department, Memphis, Tenn., resigned on January 1, 1945, to enter the private practice of pediatrics in Memphis.

LEROY L. FATHERREE, M.D.,† Health Officer of Little Rock, Ark., has been appointed registrar of vital statistics for the city. The appointment is a part of the recent transfer of the vital statistics bureau from the city clerk's office to the health department.

LAWRENCE KOLB, M.D., Medical Director, U. S. Public Health Service, in charge of the mental hygiene division, Bureau of States Services, retired on October 31, concluding thirty-five years with the Public Health Service.

COLONEL ANTHONY J. LANZA, M.C.,* who has been serving as Director of the Occupational Health Division, Preventive Medicine Service, Office of the Surgeon General, Washington, has retired from active duty to resume his work as Assistant Medical Director of the Metropolitan Life Insurance Company, New York.

CHANGES IN HEALTH OFFICERS IN MISSISSIPPI

KENNETH W. NAVIN, M.D., has been named Health Officer of Yazoo City, Miss.

HENRY G. WALDROP, M.D., has been appointed in charge of the Prentiss County Health Department, Booneville, Miss.

NORRIS C. KNIGHT, M.D.,* Meridian, Miss., has been appointed director of the Washington County Health Department.

FLORENCE J. NEELY has been appointed chief of the newly organized Division of Nutrition in the Bureau of Food Control of the Baltimore City Health Department, effective October 30.

COLONEL THOMAS B. TURNER, MC, AUS,* has been assigned as Assistant Chief of the Preventive Medicine

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* Fellow A.P.H.A.
† Member A.P.H.A.